PRINCIPALS
Robert J. Michaud, P.E.
Ronald D. Desrosiers, P.E., PTOE
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MEMORANDUM

DATE:

July 10, 2014

TO:

Mr. Robert S. Korff

Mark Investments, Inc. 54 Jaconnet Street, Suite 203

Newton, MA 02461

FROM:

Robert J. Michaud, P.E. - Managing Principal

Daniel A. Dumais, E.I.T. - Senior Transportation Engineer

RE:

Proposed CVS Pharmacy

631, 653 & 655 Mount Auburn St/ 268 Arlington St - Watertown, Massachusetts

MDM Transportation Consultants, Inc. (MDM) has prepared this traffic impact study (TIS) for a proposed CVS pharmacy to be located at 631, 653 & 655 Mount Auburn Street/268 Arlington Street in Watertown, Massachusetts. This memorandum describes existing (baseline) traffic conditions for area roadways and key study intersections, trip generation characteristics of the project and provides a qualitative assessment of incremental traffic impacts of the site.

Key findings of the traffic assessment are as follows:

Gite Traffic Generation. The proposed CVS development will replace existing gasoline/service station, office uses, and an Elks Club at the Site, resulting in a small net estimated increase of only 5 vehicle-trips during the weekday morning peak hour, a 39 vehicle-trip increase during the weekday evening peak hour and a 51 vehicle-trip increase on a Saturday Midday peak hour. These trip increases will not materially impact traffic operations on area roadways and represent fewer than 20 new vehicles per hour on Mt. Auburn Street or Arlington Street, and in the case of Wells Avenue represents up to 46 vehicles per hour (less than one vehicle per minute that are destined to Mount Auburn Street or Arlington Street to the north of Mount Auburn Street). These trip increases fall within normal day-to-day traffic fluctuations in the area.

- Mt. Auburn Street/Arlington Street Operations. The signalized Mount Auburn Street/Arlington Street intersection generally operates below capacity at Level-of-service (LOS) D or better operations during the weekday morning and Saturday midday peak hours under Existing (Baseline) conditions. Longer delays (LOS F) are experienced during the weekday evening peak hours. Negligible impact to intersection operations is anticipated as a result of the proposed site redevelopment.
- □ Safety Characteristics. No immediate safety countermeasures are required at the site driveways or the adjacent Mount Auburn Street/Arlington Street intersection based on historic crash data and trends. Proposed Site access improvements will *reduce* conflicts at the adjacent Mount Auburn Street signal by eliminating the two (2) site driveway along Arlington Street, removal of the Mount Auburn Street driveway, and installing a channelizing island to promote right-turn only egress movements onto Arlington Street.
- Mitigation. Review of signal operations at Mt. Auburn Street/Arlington Street indicates malfunctioning pedestrian pushbuttons. Recognizing the importance of controlled crossings and to facilitate pedestrian access to/from the Site, the Proponent will replace malfunctioning equipment at the signal as part of its development program.

In summary, MDM finds that the proposed use will generate only a nominal increase in trip activity at the Site that will represent fewer than 20 new vehicles per hour on Mt. Auburn Street or Arlington Street, and in the case of Wells Avenue represents up to 46 vehicles per hour (less than one vehicle per minute that are destined to Mount Auburn Street or Arlington Street to the north of Mount Auburn Street). These additional trips fall within normal day-to-day fluctuations in area traffic and will not materially impact traffic operations. Proposed access improvements will *reduce* potential vehicular conflict points along Mount Auburn Street and Arlington Street relative to existing conditions. Proponent-sponsored improvements will also include repair of pedestrian pushbutton equipment at the adjacent signal at Mt. Auburn Street/Arlington Street that will allow for controlled pedestrian crossings to/from the Site.

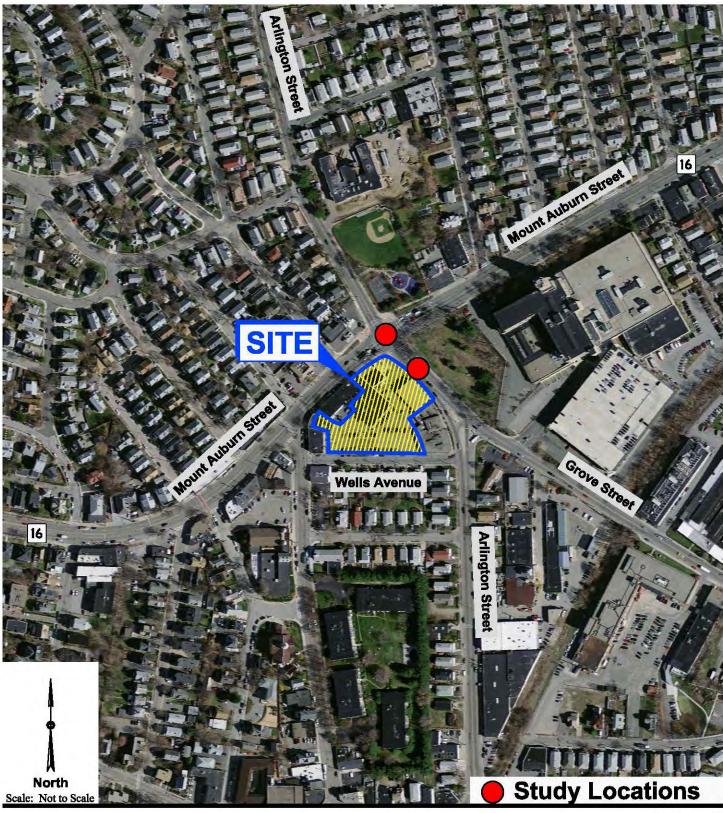
PROJECT DESCRIPTION

Existing Conditions

The existing site consists of an active 2,982± sf Citizen Bank (631 Mount Auburn Street), an active 4-pump (2 fueling position) gas station with a 1,200± sf automobile service center (655 Mount Auburn Street), a vacant 10,800± sf office building (653 Mount Auburn Street), and a 8,960± sf Elks Club – Watertown (268 Arlington Street) in Watertown, MA. The site location relative to area roadways is shown in **Figure 1**.

Access to the site is currently provided via a single (1) full access/egress driveway along Mount Auburn Street, three (3) full-access driveways along Arlington Street, and two (2) right-in/ right-out driveways along the rear portion of the property to Wells Avenue.





TRANSPORTATION CONSULTANTS, INC. Planners & Engineers

Figure 1

Site Location

Proposed Conditions

Under the proposed site program, three existing buildings on-site (automobile service center, office building, and Elks Club) will be removed and the Site will re-developed to include a 14,000± sf CVS pharmacy with a 83± space off-street parking lot (40± spaces provided for the Pharmacy). The existing 2,982± sf Citizen Bank building will remain unchanged. The existing site driveway along Mount Auburn Street (existing gas station driveway) and the two driveways on Arlington Street closest to Mount Auburn Street (existing gas station driveways) will all be removed. The Elks driveway along Arlington Street will be re-constructed to allow for full access from Arlington Street but will be restricted to right out egress movements. Likewise, the eastern driveway along Wells Avenue will be removed while the western driveway closest to Bigelow Avenue will be retained as a right-in/ right-out driveway to Wells Avenue. A preliminary site plan prepared by Bohler Engineering is presented in Figure 2.

EXISTING TRAFFIC & SAFETY CHARACTERISTICS

An overview of existing roadway conditions, traffic volumes and safety characteristics is provided below.

Roadway

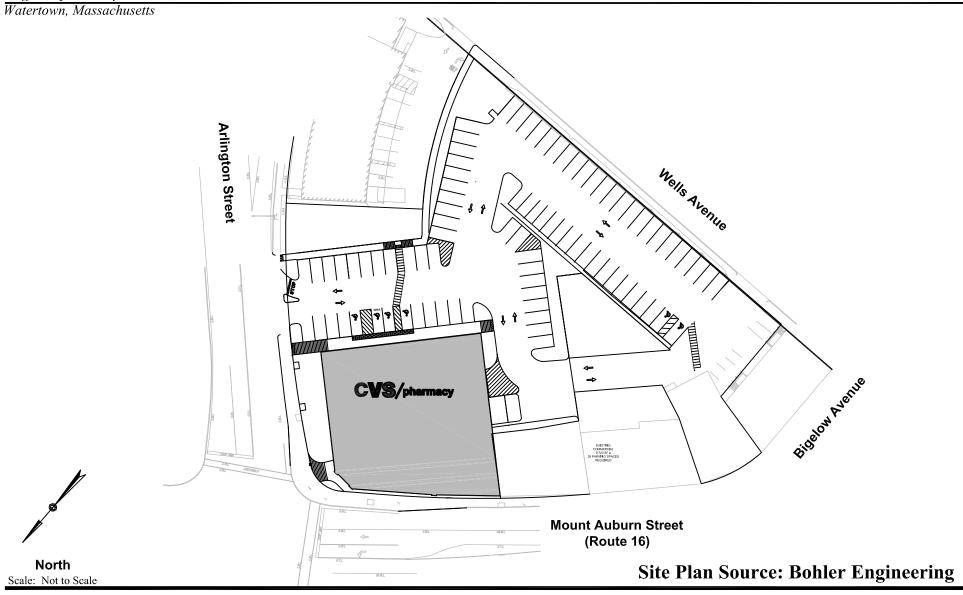
Mount Auburn Street

Mount Auburn Street (Route 16) is classified by the Massachusetts Department of Transportation (MassDOT) as a Principal Arterial roadway under local (Town) jurisdiction within the study area. Mount Auburn Street is generally an east-west roadway providing two travel lanes in each direction with additional turn lanes at major intersections within the study area. Mount Auburn Street provides a connection between Route 20 and the City line with Cambridge. Sidewalks are provided along both sides of the roadway and crosswalks are provided at major intersections within the study area. Land use along Mount Auburn Street in the site vicinity is primarily commercial and includes a Mobil gas station, 7-Eleven, Tufts Health Plan offices and several restaurants.

Arlington Street

Arlington Street is classified by MassDOT as an Urban Minor Arterial roadway under local (Town) jurisdiction within the study area. Arlington Street is generally north-south roadway that generally provides one travel lane in each direction with additional lanes at major intersections. Sidewalks are provided along both sides of the roadway and crosswalks are provided at major intersections within the study area. Land use along Arlington Street in the site vicinity generally consists of commercial, residential, recreational and community uses including Coolidge Playground and an Elks Club (Site).







Preliminary Site Layout

Baseline Traffic Data

Traffic volume data was collected at the Mount Auburn Street/Arlington Street study intersection and at the existing site driveways along Mount Auburn Street and Arlington Street during the weekday morning (7:00 AM - 9:00 AM), weekday evening (4:00 PM – 6:00 PM), and Saturday midday (11:00 AM – 1:00 PM) periods to coincide with peak traffic activity of the proposed use and the adjacent streets. Traffic data used in this evaluation was collected in November 2013. These data reflect average traffic conditions based on review of MassDOT permanent count station data for the area. Therefore, no seasonal adjustment to the November 2013 observed traffic volumes was applied. Traffic count data and MassDOT permanent count station data are provided in the **Attachments**. The baseline weekday morning, weekday evening, and Saturday midday peak hour traffic volumes for the study intersections are shown in **Figure 3**, **Figure 4** and **Figure 5**.

Existing Trip Generation – Premier Petrol

Observed trip generation for the existing Premier Petrol use at the site has been determined based on turning movement counts conducted at the site driveways in November 2013. **Table 1** presents Premier Petrol's existing trip generation characteristics during the study periods.

TABLE 1
EXISTING TRIP GENERATION – PREMIER PETROL

Period/Direction	Site Trips¹
Weekday Morning Peak Hour	
Entering	9
Exiting	<u>5</u>
Total	14
Weekday Evening Peak Hour	
Entering	10
<u>Exiting</u>	<u>9</u>
Total	19
Saturday Midday Peak Hour	
Entering	21
Exiting	<u>10</u>
Total	31

¹Based on turning movement counts conducted at the existing site driveways on November 16, 2013 and November 19, 2013.

As summarized in **Table 1**, the existing use at the site (Premier Petrol) currently generates approximately 14 vehicle trips (9 entering and 5 exiting) during the weekday morning peak hour, 19 vehicle trips (10 entering and 9 exiting) during the weekday evening peak hour and 31 vehicle trips (21 entering and 10 exiting) during the Saturday midday peak hour of the site.

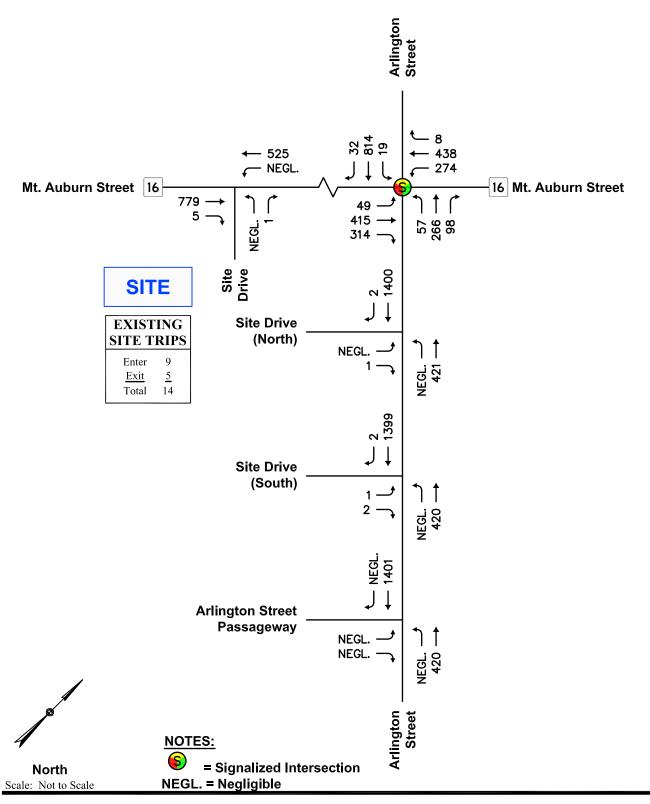
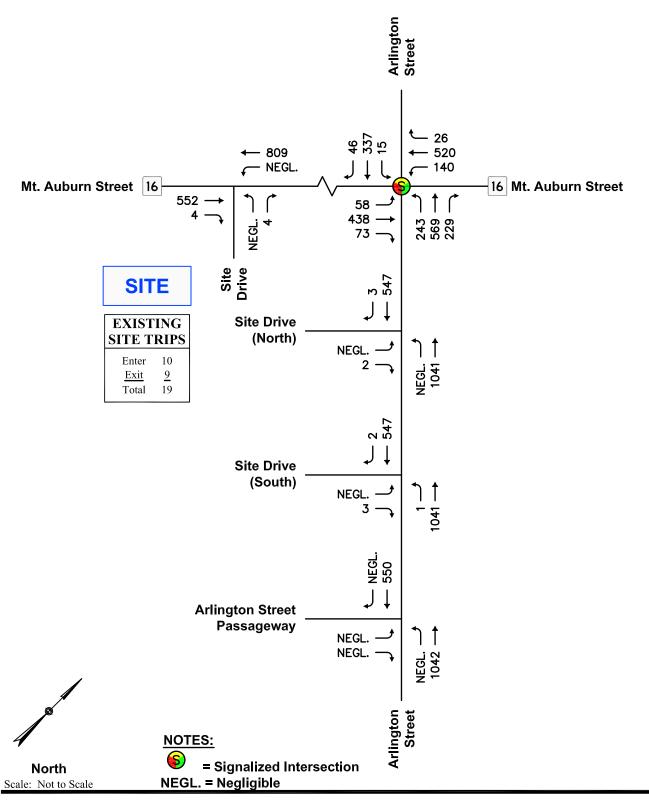


Figure 3





Existing (Baseline) Condition Weekday Evening Peak Hour Traffic Volumes

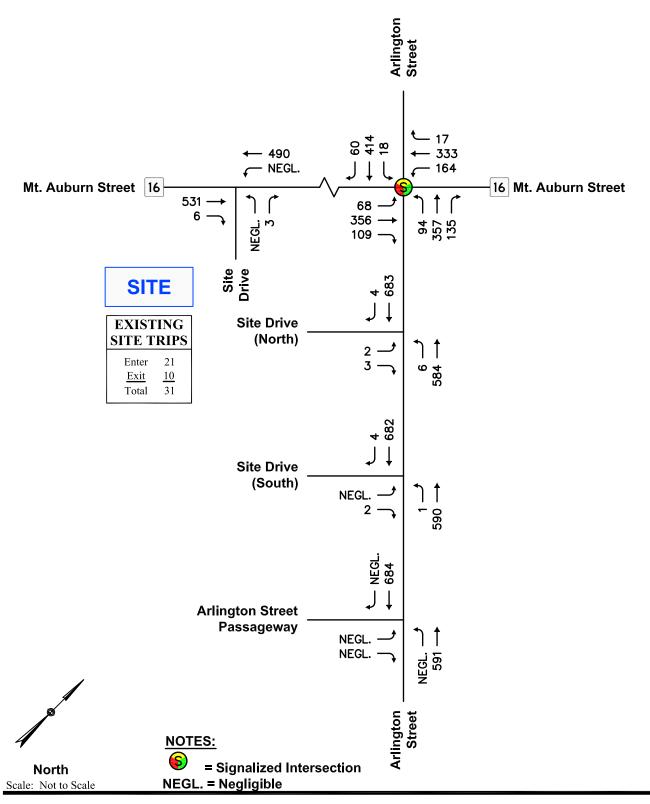


Figure 5

Intersection Crash History

In order to identify crash trends and safety characteristics for study area intersections, crash data were obtained from MassDOT for the Town of Watertown for the three-year period 2009 through 2011 (the most recent data currently available from MassDOT). Crash data for the study intersections is summarized in **Table 2** with detailed data provided in the **Attachments**.

Crash rates were calculated for the study area intersections as reported in **Table 2**. This rate quantifies the number of crashes per million entering vehicles. MassDOT has determined the official District 6 (which includes the Town of Watertown) crash rate to be 0.58 for unsignalized intersections and 0.76 for signalized intersections. This rate represents MassDOT's "average" crash experience for District 6 communities and serves as a basis for comparing reported crash rates for the study intersections. Where calculated crash rates notably exceed the district average, some form of safety countermeasures may be warranted. Crash rate calculations are provided in the **Attachments**.

As summarized in **Table 2**:

- There are a total of twelve (12) crashes reported at the Mount Auburn Street (Route 16)/ Arlington Street signalized intersection during the three-year study period. The resulting crash rate is 0.37 which is well below the District 6 average of 0.76 for signalized intersections. The majority of crashes involved single vehicle crashes (33%) followed by angle-type (25%), and rear-end (25%) type collisions. The majority (75%) resulted in property damage type crashes under dry roadway conditions (83%). All but one (1) of the reported crashes occurred outside of the weekday morning and evening peak commuter periods.
- There were no reported crashes at the site driveways during the three-year study period.

In summary, the study intersections all experienced crash rates well below the District 6 averages and no immediate safety countermeasures are warranted based on the crash history at the study intersections.

TABLE 2 INTERSECTION CRASH SUMMARY 2009 THROUGH 2011¹

	INTERSECTION
	Mt Auburn Street (Route 16) at
Data Category	Arlington Street
Traffic Control	Signalized
Crash Rate ²	0.37
District 6 Avg ³	0.76
Year:	
2009	5
2010	4
<u>2011</u>	<u>3</u>
Total	12
Туре:	
Angle	3
Rear-End	3
Head-On	1
Sideswipe	1
Single Vehicle	4
Other/Unknown	0
Severity:	
P. Damage Only	9
Personal Injury	3
Fatality	0
Unknown	0
Conditions:	
Dry	10
Wet	2
Snow	0
Other/Unknown	0
Time:	
7:00 to 9:00 AM	0
4:00 to 6:00 PM	1
Rest of Day	11

¹Source: MassDOT Crash Database

² Crashes per million entering vehicles

³ District 6 averages = 0.76 (signalized) and 0.58 (unsignalized)

PROJECTED TRIP GENERATION

The trip generation estimates for the proposed pharmacy development are provided for the weekday morning, weekday evening and Saturday midday periods, which correspond to the critical analysis periods for the proposed use and adjacent street traffic flow. Under the proposed development program, the existing Premier Petrol gas station, vacant office building, and Elks Club building will be removed and a 14,000± sf pharmacy building will be constructed. The existing Citizen Bank building will remain unchanged.

Trip Generation Methodology

New traffic generated by the pharmacy development was estimated using trip rates published in ITE's *Trip Generation*¹ for the Land Use Code (LUC) 880 (Pharmacy/Drugstore without Drive-Through Window). Trip rates for ITE LUC 880 were applied to the proposed 14,000± sf pharmacy building.

The trip estimates were then adjusted to reflect pass-by traffic, which represents the portion of site-generated trips that is drawn from the existing traffic stream and that is not "new" traffic to area roadways. A pass-by rate of 53% was applied per ITE guidance for the pharmacy (without drive-through window) land use category. Trip generation calculations are provided in the **Attachments.**

As a conservative measure, no credit or reduction is taken for trips that may be shared between the adjacent commercial land uses. Furthermore, no reduction in trips was taken for pedestrian-related trips, despite the likelihood that walking trips will represent a significant portion of business for the site from the neighborhood and/or local businesses. The trip generation for the Site is presented below in **Table 3**.

¹ Trip Generation, Ninth Edition; Institute of Transportation Engineers; Washington, DC; 2012.

TABLE 3
TRIP-GENERATION SUMMARY

		Site Trips¹	
Period/Direction	Total	Pass-By	Net New
Weekday Morning Peak Hour			
Entering	27	-11	16
<u>Exiting</u>	<u>14</u>	<u>-11</u>	<u>3</u>
Total	41	-22	19
Weekday Evening Peak Hour			
Entering	58	-31	27
<u>Exiting</u>	<u>60</u>	<u>-31</u>	<u>29</u>
Total	118	-62	56
Saturday Midday Peak Hour			
Entering	74	-40	34
<u>Exiting</u>	<u>76</u>	<u>-40</u>	<u>36</u>
Total	150	-80	70
Weekday Daily	1,260	-668	592
Saturday Daily	1,604	-850	754

Source: ITE Trip Generation, Ninth Edition; 2012.

As summarized in **Table 3**, the proposed pharmacy development is estimated to generate approximately 19 new vehicle trips (16 entering and 3 exiting) during the weekday morning peak hour, 56 new vehicle trips (27 entering and 29 exiting) during the weekday evening peak hour and 70 new vehicle trips (34 entering and 36 exiting) during the Saturday midday peak hour. On a daily basis, the proposed development is estimated to generate approximately 592 new vehicle trips on a weekday and 754 new vehicle trips on a Saturday with 50 percent entering and exiting.

Comparison to Existing Site Uses

Table 4 presents a summary of the net peak hour trip increases for the site based on the anticipated use of the Site by a CVS pharmacy compared to the operational characteristics of the existing Site uses (Premier Petrol, office space, and Elks Lodge). The Premier Petrol use was based on observations at the Site driveways, the office space was estimated base on ITE Trip Generation guidelines based on historical employment levels, and field observations indicated that the Elks Club generated negligible trips during the peak study periods during normal operations as a Fraternal Club.

¹Based on ITE LUC 880 applied to 14,000 sf; adjusted to reflect 53% pass-by trips per ITE guidance.

TABLE 4
TRIP-GENERATION COMPARISON

			Net Site Trips	3	
	Pharmacy	Gas Station	Office	Elks	Net
Period/Direction	(Proposed)1	(Existing) ²	(Existing) ³	(Existing) ⁴	Difference
Weekday Morning Pe	eak Hour	1			
Entering	16	5	5	Negl.	+6
<u>Exiting</u>	<u>3</u>	<u>3</u>	<u>1</u>	<u>Negl.</u>	<u>-1</u>
Total	19	8	6	Negl.	+5
Weekday Evening Pe	ak Hour	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Entering	27	6	1	Negl.	+20
<u>Exiting</u>	<u>29</u>	<u>5</u>	<u>5</u>	<u>Negl.</u>	<u>+19</u>
Total	56	11	6	Negl.	+39
Saturday Midday Ped	ık Hour	1			
Entering	34	12	1	Negl.	+21
<u>Exiting</u>	<u>36</u>	<u>6</u>	<u>0</u>	<u>Negl.</u>	<u>+30</u>
Total	70	18	1	Negl.	+51

¹ Net New Trips after applying pass-by factor of 53% - see Table 3

As summarized in **Table 4**, relative to the existing uses at the site (Premier Petrol, vacant office space, and Elks Lodge), the proposed Pharmacy is expected to result in a small net estimated increase of only 5 vehicle-trips during the weekday morning peak hour, a 39 vehicle-trip increase during the weekday evening peak hour and a 51 vehicle-trip increase on a Saturday Midday peak hour. This represents approximately one to two additional vehicles every two minutes at the site driveways – a level of traffic increase that is immaterial and will not measurably impact area traffic flow or traffic operations.`

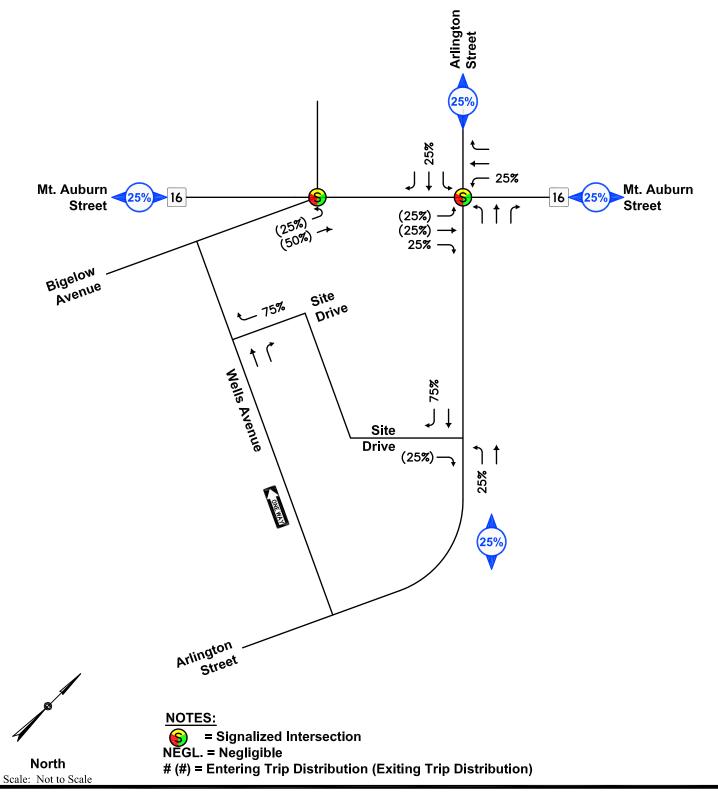
Trip Distribution

The distribution for projected traffic for the proposed pharmacy development is based primarily on existing travel patterns and volumes of the adjacent roadway system. The resulting trip distribution for new trips is presented in **Figure 6** for the weekday morning, weekday evening and Saturday midday peak hours. Trip distribution calculations are provided in the **Attachments**.

² Observed trip activity as reported in Table 1 reduced by 42 percent to reflect pass-by trips per ITE Land Use Code 944 (Gasoline/Service Station).

³Based on ITE LUC 710 (General Office) applied to 12 employees; estimated employment level of the most recent building tenant.

⁴Negl. = Negligible; no trip credit was taken for the Elks use under normal operating conditions.





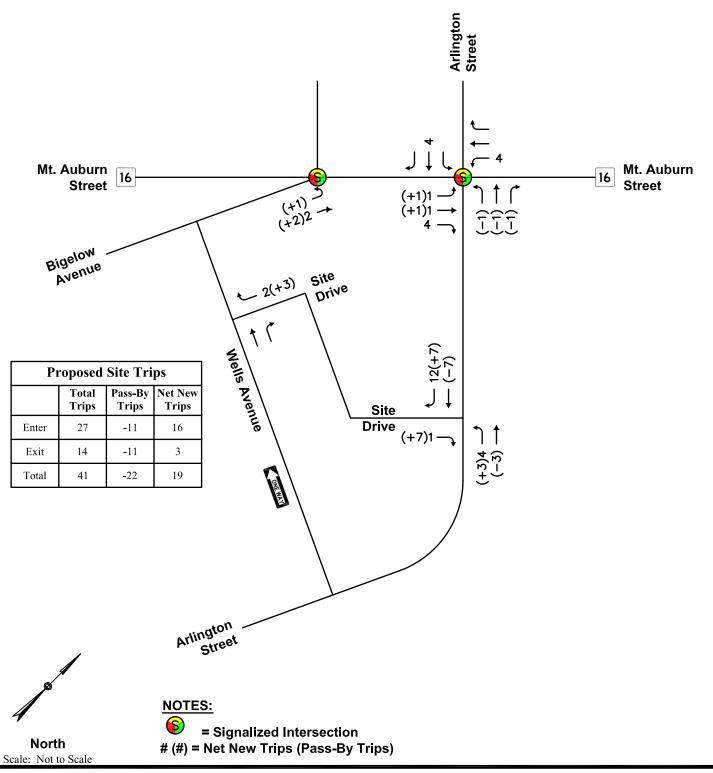
Trip Distribution

Development-related trips for the proposed pharmacy are assigned to the roadway network using the ITE trip-generation estimates shown in **Table 3** and the distribution patterns presented in **Figures 6**. Development-related trips at each intersection approach for the weekday morning, weekday evening and Saturday midday peak hours are quantified in **Figure 7**, **Figure 8** and **Figure 9**, respectively.

In summary, approximately 25% of trips will be oriented along Mount Auburn Street either east or west of the Site, and 25% along Arlington Street either north or south of the site. As with existing observed site trip patterns, virtually all of these trips will be right-turns into or exiting the site, except for a small number of left-turns into the property from Arlington Street. Relative trip increases for the pharmacy use therefore represent fewer than 20 new vehicles per hour on Mt. Auburn Street or Arlington Street, and in the case of Wells Avenue represents up to 46 vehicles per hour (less than one vehicle per minute that are destined to Mount Auburn Street or Arlington Street to the north of Mount Auburn Street).

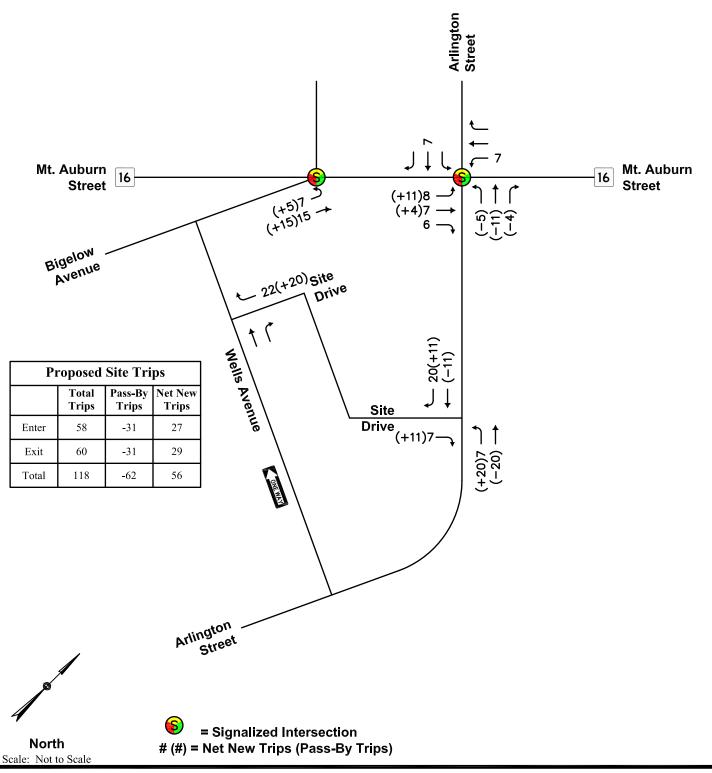
Design Year Traffic Conditions

Design Year condition traffic volumes are derived by adding the incremental traffic increases for a pharmacy use at the site to the Existing (Baseline) conditions. As part of the proposed development plan, the existing gas station use at the site will be eliminated. Therefore, in order to obtain the future Design Year traffic volumes, the trips associated with the existing use at the site were removed from the roadway network and the trips associated with the proposed pharmacy use (as presented in **Table 3**) were added to the Existing (Baseline) traffic volumes. **Figure 10**, **Figure 11** and **Figure12** present the Design Year condition traffic-volume networks for the weekday morning, weekday evening and Saturday midday peak hours, respectively. Trip tracings for removal of the existing site trips are presented in the **Attachments**.



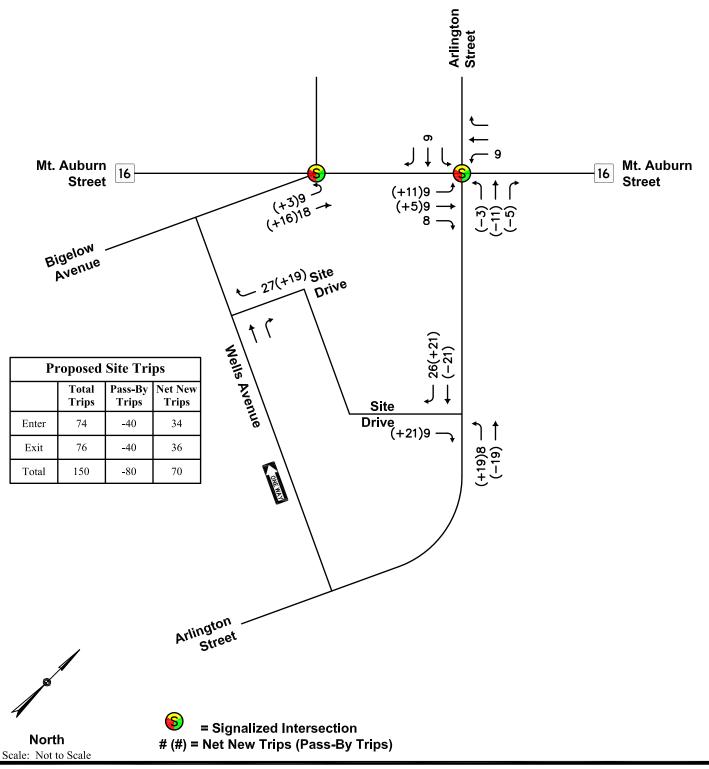


Site-Generated Trips Weekday Morning Peak Hour



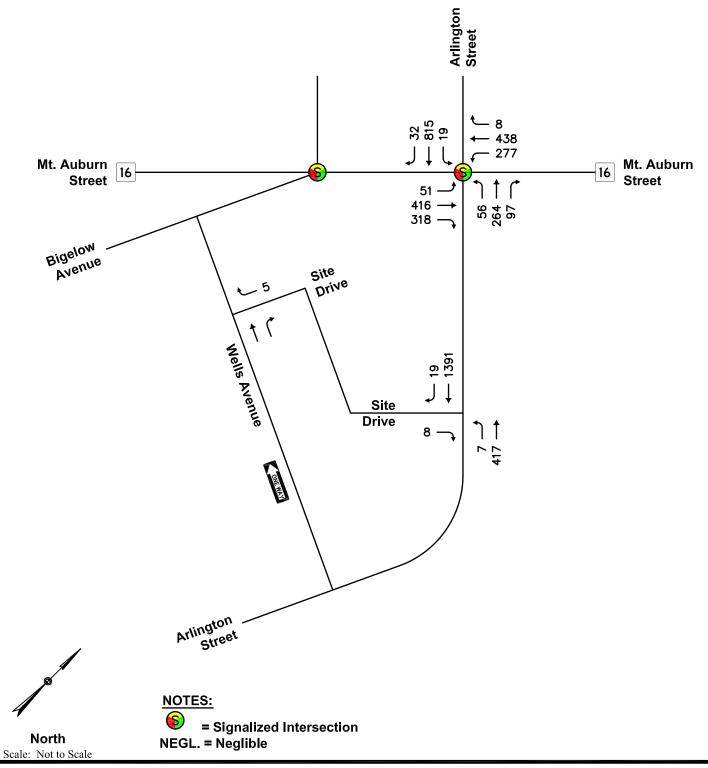


Site-Generated Trips Weekday Evening Peak Hour



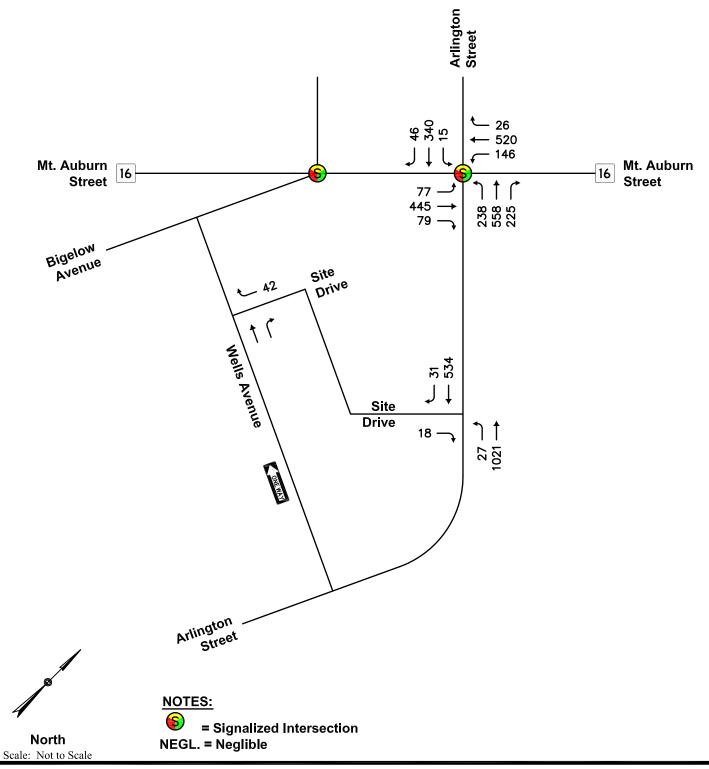


Site-Generated Trips Saturday Midday Peak Hour



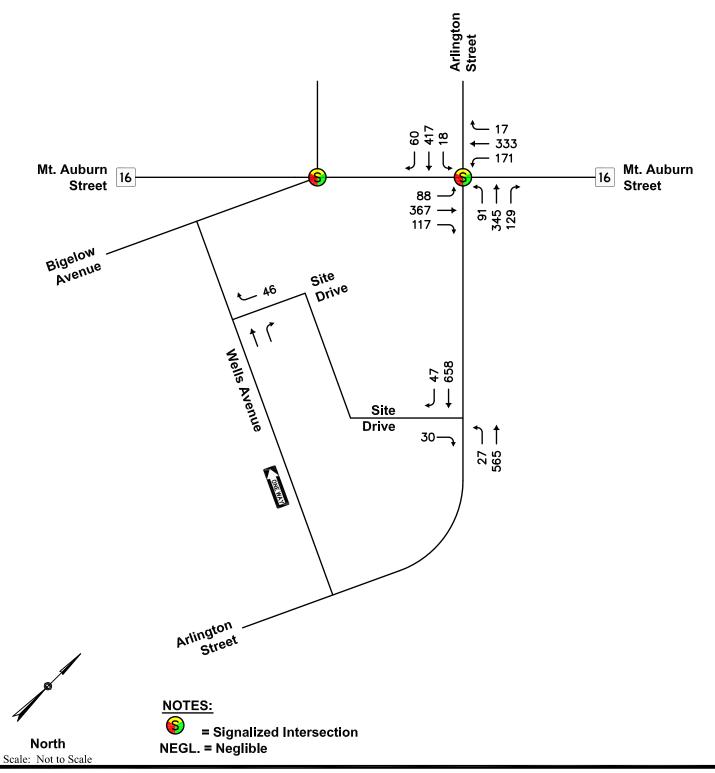


Design Year Condition Weekday Morning Peak Hour





Design Year Condition Weekday Evening Peak Hour





Design Year Condition Saturday Midday Peak Hour

SIGNALIZED INTERSECTION OPERATIONS ANALYSIS

This section provides an overview of operational analysis methodology and an assessment of the Mount Auburn Street/Arlington Street signalized operations under Existing (Baseline) and projected future Design Year Conditions.

Analysis Methodology

Intersection capacity analyses are presented in this section for the Existing and Design Year traffic-volume conditions for the Mount Auburn Street/Arlington Street signalized intersection. Capacity analyses, conducted in accordance with EEA/MassDOT guidelines, provide an index of how well the roadway facilities serve the traffic demands placed upon them. The operational results provide the basis for recommended access and roadway improvements in the following section.

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the 2010 Highway Capacity Manual (HCM). The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 80 seconds for signalized movements). The specific control delays and associated LOS designations are presented in the **Attachments**.

Analysis Results

Level-of-Service (LOS) analyses were conducted for the Existing (Baseline) and Design Year conditions for the study intersections. The results of the intersection capacity are summarized below in **Table 5**. Detailed analysis results are presented in the **Attachments**.



TABLE 5
INTERSECTION CAPACITY ANALYSIS RESULTS
MOUNT AUBURN STREET/ARLINGTON STREET

	Ex	cisting (Baselir	ne)		Design Year	
Period/Approach	v/c¹	Delay ²	LOS ³	v/c	Delay	LOS
Weekday Morning Peak Hour						***************************************
Eastbound	1.00	72	Е	1.02	75	E
Westbound	0.69	26	С	0.69	26	C
Northbound	0.71	39	D	0.70	38	D
<u>Southbound</u>	<u>0.89</u>	<u>47</u>	<u>D</u> D	0.89	<u>47</u>	<u>D</u> D
Overall	1.00	47	D	1.00	48	D
Weekday Evening Peak Hour						
Eastbound	0.45	29	С	0.46	29	С
Westbound	0.40	18	В	0.42	18	В
Northbound	>1.0	>80	F	>1.0	>80	F
<u>Southbound</u>	<u>0.46</u>	<u>30</u>	<u>C</u>	0.47	<u>30</u>	<u>C</u> F
Overall	>1.0	>80	F	>1.0	>80	F
Saturday Midday Peak Hour						
Eastbound	0.44	33	С	0.45	33	С
Westbound	0.44	22	С	0.46	22	С
Northbound	0.80	41	D	0.80	41	D
<u>Southbound</u>	<u>0.52</u>	<u>31</u>	<u>C</u>	<u>0.53</u>	<u>31</u>	<u>C</u>
Overall	0.80	32	С	0.80	32	C

¹Volume-to-capacity ratio

As summarized in **Table 5**, the signalized Mount Auburn Street/Arlington Street intersection generally operates below capacity at LOS D or better (overall) operations during the weekday morning and Saturday midday peak hours under Existing (Baseline) conditions. Longer delays (LOS F) are experienced during the weekday evening peak hours. The proposed redevelopment of the site into a pharmacy is expected to have negligible impact on signalized intersection operations with no change in level of service anticipated.

Signal Queue Impacts

The estimated average and 95th percentile vehicle queue lengths for the traffic signal at Mount Auburn Street (Route 16)/Arlington Street are presented in **Table 6**. The estimated queue lengths are based on the capacity analysis results provided using Synchro computer software.

²Average control delay per vehicle (in seconds)

³Level of service

TABLE 6
VEHICLE QUEUE ANALYSIS SUMMARY
MOUNT AUBURN STREET/ARLINGTON STREET

		Existing	(Baseline)	Design Year					
Period/Approach	Available Queue Storage Length (feet)	Average Queue Length ¹	Maximum Queue Length ¹	Average Queue Length ¹	Maximum Queue Length				
Weekday Morning Peak Hour									
Eastbound L	75±	<25	63	26	67				
Eastbound T/R	300±	233	417	236	420				
Westbound L	200±	87	365	88	370				
Westbound T/R	>1000	71	163	71	163				
Northbound L/T/R	$300\pm/>1000^2$	129	188	127	186				
Southbound L/T/R	150±/>1000³	286	402	287	403				
Weekday Evening Peak Hour									
Eastbound L	75±	26	75	35	96				
Eastbound T/R	300±	131	232	134	237				
Westbound L	200±	45	118	47	123				
Westbound T/R	>1000	100	203	99	203				
Northbound L/T/R	300±/>1000	478	643	467	626				
Southbound L/T/R	150±/>1000	109	165	111	167				
Saturday Midday Peak Hour									
Eastbound L	75±	31	86	41	109				
Eastbound T/R	300±	119	223	125	244				
Westbound L	200±	54	142	55	158				
Westbound T/R	>1000	60	135	58	135				
Northbound L/T/R	300±/>1000	182	256	177	245				
Southbound L/T/R	150±/>1000	137	190	140	192				

¹Average and 95th percentile queue lengths are reported in feet per lane.

As summarized in **Table 6**, the calculated average and maximum (95th percentile) queues are generally within the available queue storage lengths. Queues along the northbound Arlington Street approach and eastbound Mount Auburn Street approach to the intersection often extend beyond the site driveways during peak hours. Field observations also indicate that queues often extend beyond the site driveways resulting in only occasional left-turn movements exiting the site on to Mount Auburn Street and Arlington Street. The proposed redevelopment of the site is anticipated to remove four driveways and will restricting left turns from the site onto both Arlington Street and Mount Auburn Street; therefore the project will have negligible impact to queues at the Mount Auburn Street/Arlington Street intersection.

²The northbound through/left-turn lane has a storage capacity of approximately 300 ft and the northbound through/right-turn lane has a storage capacity of more than 1,000 ft.

³The southbound through/left-turn lane has a storage capacity of approximately 200 ft and the southbound through/right-turn lane has a storage capacity of more than 500 ft.

CONCLUSIONS

In summary, MDM finds that the proposed use will generate only a nominal increase in trip activity at the Site that will represent fewer than 20 new vehicles per hour on Mt. Auburn Street or Arlington Street, and in the case of Wells Avenue represents up to 46 vehicles per hour (less than one vehicle per minute that are destined to Mount Auburn Street or Arlington Street to the north of Mount Auburn Street). These additional trips fall within normal day-to-day fluctuations in area traffic and will not materially impact traffic operations. Proposed access improvements will *reduce* potential vehicular conflict points along Mount Auburn Street and Arlington Street relative to existing conditions. Proponent-sponsored improvements will also include repair of pedestrian pushbutton equipment at the adjacent signal at Mt. Auburn Street/Arlington Street that will allow for controlled pedestrian crossings to/from the Site.

Attachments

- □ Traffic Volume Data
- □ Seasonal Data
- □ Crash Data
- □ Trip Generation Calculations
- □ Trip Distribution Calculations
- □ Existing Site Trip Tracings
- □ Capacity Analysis Worksheets

			•	

□ Traffic Volume Data

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

W: Mt.Auburn Street (Route 16)

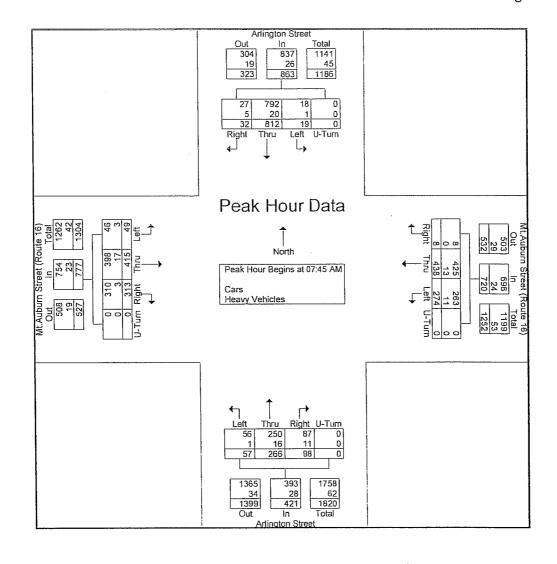
ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 AA

Site Code: 743

Start Date : 11/19/2013



28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

W: Mt.Auburn Street (Route 16)

ity, State: Watertown, MA

lient: MDM/ C. Jones

File Name: 133646 AA

Site Code: 743

Start Date : 11/19/2013

								Gro	ups Prin	ited- Cars	- Heav	y Vehicl	es								
			ngton S			Mi			(Route	16)		Arli	ngton S	Street		M	t.Aubur	n Street	(Route	16)]
	,		rom No	rth				rom Ea	st			F	rom So	uth .			F	rom We	est	•	l
tart Time	Right	Thru	Left	U-Tum	App Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Int, Total
07:00 AM	5	167	6	0	178	0	72	49	0	121	11	42	10	0	63	78	81	14	0	173	535
07:15 AM	7	195	2	0	204	3	97	67	0	167	17	63	16	0	96	60	82	6	0	148	615
07:30 AM	4	212	4	0	220	4	102	61	0	167	11	70	8	0	89	82	107	16	0	205	681
07:45 AM	13	211	1	0	225	1	107	55	0	163	20	68	8	0	96	91	113	17	0	221	705
Total	29	785	13	0	827	8	378	232	0	618	59	243	42	0	344	311	383	53	0	747	2536
08:00 AM	1 6	204	10	0	220	2	117	65	0	184	22	56	13	0	91	87	97	12	0	196	004
08:15 AM	6	199	3	0	208	2	110	77	0	189	20	75	17	0	112	1			_		691
08:30 AM	7	198	5	0	210	2			_		Į.			_		76	106	11	0	193	702
	12		-	-		3	104	77	0	184	36	67	19	0	122	59	99	9	0	167	683
08:45 AM	13	180	4	0	197	1	98	64	0	163	27	47	12	0	86	57	106	14	0	177	623
Total	32	781	22	0	835	8	429	283	0	720	105	245	61	0	411	279	408	46	0	733	2699
rand Total	61	1566	35	0	1662	16	807	515	0	1338	164	488	103	0	755	590	791	99	0	1480	5235
Apprch %	3.7	94.2	2.1	0		1.2	60.3	38.5	0		21.7	64.6	13.6	0		39.9	53.4	6.7	0		0200
Total %	1.2	29.9	0.7	0	31.7	0.3	15.4	9.8	0	25.6	3.1	9.3	2	0	14.4	11.3	15.1	1.9	Ō	28.3	
Cars	53	1533	34	0	1620	16	771	488	0	1275	135	459	97	0	691	585	755	90	0	1430	5016
% Cars	86.9	97.9	97.1	0	97.5	100	95.5	94.8	0	95.3	82.3	94.1	94.2	0	91.5	99.2	95.4	90.9	0	96.6	95.8
leavy Vehicles	8	33	1	0	42	0	36	27	0	63	29	29	6	0	64	5	36	9	0	50	219
% Hea∨y Vehicles	13.1	2.1	2.9	0	2.5	0	4.5	5.2	0	4.7	17.7	5.9	5.8	0	8.5	0.8	4.6	9.1	0	3.4	4.2

			ington S			Mt.Auburn Street (Route 16)						Arli	ngton S	treet		Mi	16)				
	ļ		rom No	rth			F	rom Ea	ıst			F	rom Soi	uth			F	rom We	est		
Start Time	Right	Thru	Left		App, Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Tum	App, Total	Int. Total
ak Hour Analy	sis Fron	n 07:00 A	AM to 08:	45 AM -	Peak 1 of	1							•			<u> </u>					
eak Hour fo	or Entire	e Inters	section	Begins	s at 07:4	5 AM															
07:45 AM	13	211	1	0	225	1	107	55	0	163	20	68	8	0	96	91	113	17	0	221	705
MA 00:80	6	204	10	0	220	2	117	65	0	184	22	56	13	0	91	87	97	12	0	196	691
08:15 AM	6	19 9	3	0	208	2	110	77	0	189	20	75	17	0	112	76	106	11	0	193	702
08:30 AM	7	198	5	0	210	3	104	77	0	184	36	67	19	0	122	59	99	9	0	167	683
Fotal Volume	32	812	19	0	863	8	438	274	0	720	98	266	57	0	421	313	415	49	0	777	2781
6 App. Total	3.7	94.1	2.2	0		1.1	60.8	38.1	0		23.3	63.2	13.5	0		40.3	53.4	6.3	0		
PHF	.615	.962	.475	.000	.959	.667	.936	.890	.000	.952	.681	.887	.750	.000	.863	.860	.918	.721	.000	.879	.986
Cars	27	792	18	0	837	8	425	263	0	696	87	250	56	0	393	310	398	46	0	754	2680
% Cars	84.4	97.5	94.7	0	97.0	100	97.0	96.0	0	96.7	88.8	94.0	98.2	0	93.3	99.0	95.9	93.9	0	97.0	96.4
Heavy Vehicles	5	20	1	0	26	0	13	11	0	24	11	16	1	0	28	3	17	3	0	23	101
DC 1.1mm 34.4.1-1-1-	156	2.5	53	Λ	3 0	n	3 (1	4.0	Λ	33	1112	6.0	10	Λ	6.7	10	4.4	C 4	_	2.0	0.0

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

W: Mt.Auburn Street (Route 16)

y, State: Watertown, MA

ent: MDM/ C. Jones

File Name: 133646 AA

Site Code: 743

Start Date : 11/19/2013

Page No : 1

Groups Printed- Peds and Bikes

			ngton S			Mt.Auburn Street (Route 16)						ngton S			Mt.Auburn Street (Route 16)						
		Fı	om No	rth			F	rom Ea	st			Fr	om Sou	uth			F	rom We	st		
art Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
7:00 AM	0	1	0	2	3	0	1	0	0	1	0	0	0	3	3	1	0	0	1	2	9
7:15 AM	0	1	0	1	2	0	1	0	1	2	0	. 0	0	0	0	0	2	0	1	3	7
7:30 AM	0	1	0	8	9	0	1	0	1	2	0	0	0	5	5	0	2	0	0	2	18
7:45 AM	0	2	0	1	3	0	3	0	4	7	0	0	0	10	10	0	0	0	2	2	22
Total	0	5	0	12	17	0	6	0	6	12	0	0	0	18	18	1	4	0	4	9	56
MA 00:80	0	3	0	4	7	0	2	0	1	3	2	0	0	10	12	1	3	0	0	4	26
8:15 AM	0	1	1	4	6	0	3	0	2	5	0	0	0	10	10	0	3	0	1	4	25
08:30 AM	0	2	0	3	5	0	2	3	1	6	0	0	0	11	11	0	4	0	0	4	26
08:45 AM	0	0	0	3	3	0	3	1	0	4	0	1	0	12	13	1	4	0	1	6	26_
Total	0	6	1	14	21	0	10	4	4	18	2	1	0	43	46	2	14	0	2	18	103
and Total	0	11	1	26	38	0	16	4	10	30	2	1	0	61	64	3	18	0	6	27	159
Apprch %	0	28.9	2.6	68.4		0	53.3	13.3	33.3		3.1	1.6	0	95.3		11.1	66.7	0	22.2		
Total %	0	6.9	0.6	16.4	23.9	0	10.1	2.5	6.3	18.9	1.3	0.6	0	38.4	40.3	1.9	11.3	0	3.8	17	

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

W: Mt.Auburn Street (Route 16)

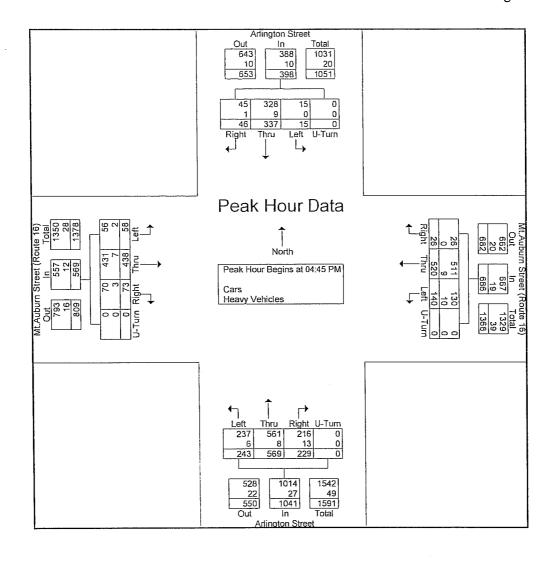
ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 AAA

Site Code: 743

Start Date : 11/19/2013



MDM TRANSPORTATION CONSULTANTS, INC. 28 Lord Road, Suite 280

Marlborough, MA 01752

S: Arlington Street

W: Mt.Auburn Street (Route 16)

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 AAA

Site Code: 743

Start Date : 11/19/2013

										ted- Cars	- Heav	y Vehicl	es								
			ngton S			M			(Route	16)			ngton S		***************************************	M	t.Auburr	Street	(Route	16)	
, , , , , , , , , , , , , , , , , , , 	D:		rom No					rom Ea	st			F	rom So	uth			F	rom We	est		
tart Time	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
04:00 PM	13	76	5	0	94	4	121	36	0	161	46	130	66	0	242	22	76	13	0 '	111	608
D4:15 PM	15	75	2	0	92	7	123	58	0	188	51	139	63	0	253	28	89	13	Õ	130	663
D4:30 PM	8	82	6	0	96	6	117	40	0	163	65	130	59	Ō	254	15	115	9	0	139	652
04:45 PM	10	79	2	0	91	10	123	31	0	164	48	139	57	Ő	244	23	100	10	0	133	632
Total	46	312	15	0	373	27	484	165	0	676	210	538	245	0	993	88	380	45	0	513	2555
					,				_			000	210	Ü	333	00	300	45	U	313	2000
05:00 PM	9	84	3	0	96	6	131	37	0	174	83	138	64	0	285	20	107	15	0	142	697
D5:15 PM	12	91	7	0	110	4	136	29	0	169	53	157	60	Ō	270	17	114	15	. 0	146	695
D5:30 PM	15	83	3	0	101	6	130	43	0	179	45	135	62	Ō	242	13	117	18	0	148	670
05:45 PM	14	104	6	0	124	1	115	29	Ō	145	40	128	49	0	217	20	100	8	0	128	614
Total	50	362	19	0	431	17	512	138	0	667	221	558	235	0	1014	70	438	56	0	564	2676
									J	00,	,	000	200	U	1017	70	430	30	U	504	2076
rand Total	96	674	34	0	804	44	996	303	0	1343	431	1096	480	0	2007	158	818	101	0	1077	5231
Apprch %	11.9	83.8	4.2	0		3.3	74.2	22.6	0		21.5	54.6	23.9	Õ	2001	14.7	76	9.4	0	10//	3231
Total %	1.8	12.9	0.6	0	15.4	0.8	19	5.8	0	25.7	8.2	21	9.2	0	38.4	3	15.6	1.9	0	20.6	
Cars	92	660	34	0	786	43	973	281	0	1297	402	1082	473	0	1957	154	794	98	0		5000
% Cars	95.8	97.9	100	0	97.8	97.7	97.7	92.7	Ö	96.6	93.3	98.7	98.5	0	97.5	97.5	97.1	96 97	-	1046	5086
eavy Vehicles	4	14	0	0	18	1	23	22	0	46	29	14	7	0	50	97.5	24		0	97.1	97.2
Heavy Vehicles	4.2	2.1	0	Õ	2.2	2.3	2.3	7.3	0	3.4	6.7	1.3	1.5	0	2.5			3	-	31	145
, ,			·	•	1	2.0	2.0	٠.5	U	J.4	0.7	۱.٦	1.5	U	2.5	2.5	2.9	3	0	2.9	2.8

	}		ngton S			Mt.Auburn Street (Route 16)						Arli		Mt.Auburn Street (Route 16)							
			rom No	rth	-	From East					From South					From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
ık Hour Analy								******									.,,,,,	2011	0-1001	мрр. тогат	mi. Tutar
ak Hour fo	or Entire	e Inters	section	Begins	s at 04:4	5 PM															
04:45 PM	10	79	2	0	91	10	123	31	0	164	48	139	57	0	244	23	100	10	٥	133	632
05:00 PM	9	84	3	0	96	6	131	37	0	174	83	138	64	0	285	20	107	15	n	142	697
05:15 PM	12	91	7	0	110	4	136	29	0	169	53	157	60	Ö	270	17	114	15	0	146	695
05:30 PM	15	83	3	0	101	6	130	43	0	179	45	135	62	Ō	242	13	117	18	n	148	670
otal Volume	46	337	15	0	398	26	520	140	0	686	229	569	243	0	1041	73	438	58	0	569	2694
App. Total	11.6	84.7	3.8	0		3.8	75.8	20.4	0		22	54. 7	23.3	Ō		12.8	77	10.2	0	303	2034
PHF	.767	.926	.536	.000	.905	.650	.956	.814	.000	.958	.690	.906	.949	.000	.913	.793	.936	.806	.000	.961	.966
Cars	45	328	15	0	388	26	511	130	0	667	216	561	237	0	1014	70	431	56	0	557	2626
% Cars	97.8	97.3	100	0	97.5	100	98.3	92.9	0	97.2	94.3	98.6	97.5	0	97.4	95.9	98.4	96.6	Õ	97.9	97.5
eavy Vehicles	1	9	0	0	10	0	9	10	0	19	13	8	6	0	27	3	7	2	n	12	68
Heavy Vehicles	2.2	2.7	0	0	2.5	0	1.7	7.1	0	2.8	5.7	1.4	2.5	0	2.6	4.1	1.6	3.4	Õ	21	2.5

28 Lord Road, Suite 280 Marlborough, MA 01752

'S: Arlington Street

W: Mt.Auburn Street (Route 16)

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 AAA

Site Code: 743

Start Date : 11/19/2013

Groups	Printed-	Peds	and	Bikes

								હ	roups i	rinteu- r	eus and	Bikes									
	Arlington Street						Mt.Auburn Street (Route 16)						ngton S	treet		Mi					
	From North				From East						Fr	om Soi	uth		From West						
tart Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App Total	Int. Total
04:00 PM	0	0	0	4	4	0	1	0	1	2	0	0	0	5	5	0	0	0	3	3	14
04:15 PM	0	0	0	2	2	0	1	0	3	4	1	0	0	3	4	0	0	0	2	2	12
04:30 PM	0	0	0	4	4	0	2	0	2	4	0	0	0	4	4	0	1	0	1	2	14
04:45 PM	0	0	0	6	6	0	2	0	4	6	0	1	0	7	8	0	0	0	2	2	22
Total	0	0	0	16	16	0	6	0	10	16	1	1	0	19	21	0	1	0	8	9	62
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0	0	0	2	2	8
05:15 PM	0	0	0	1	1	0	1	0	2	3	0	3	0	7	10	0	0	0	1	1	15
05:30 PM	0	0	0	3	3	1	3	1	1	6	0	1	0	2	3	0	1	0	0	1	13
05:45 PM	0	1	0	5	6	0	2	2	3	7	0	1	1	7	9	0	1	0	2	3	25
Total	0	1	0	9	10	1	6	3	6	16	0	5	1	22	28	0	2	0	5	7	61
rand Total	0	1	0	25	26	1	12	3	16	32	1	6	1	41	49	0	3	0	13	16	123
Apprch %	0	3.8	0	96.2		3.1	37.5	9.4	50		2	12.2	2	83.7		0	18.8		81.2		
Total %	1 0	8.0	0	20.3	21.1	8.0	9.8	2.4	13	26	0.8	4.9	8.0	33.3	39.8	0	2.4	0	10.6	13	

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

W: Mt.Auburn Street (Route 16)

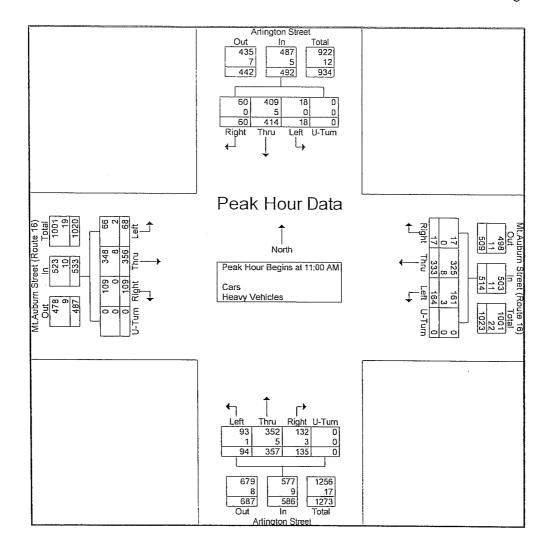
ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name : 133646 A

Site Code: 743

Start Date : 11/16/2013



28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

W: Mt.Auburn Street (Route 16)

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 A

Site Code: 743

Start Date : 11/16/2013

								Grou	ıps Prin	ted- Cars	- Heavy	/ Vehicl	es								
			ngton S			Mt	.Auburr	Street	(Route	16)		Arli	ngton S	Street		M	t.Auburi	Street	(Route	16)	
			rom No	rth			F	rom Ea	st			, F.	rom So	uth			F	rom We	est		
tart Time	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App. Total	Int, Total
1:00 AM	9	107	4	0	120	3	98	43	0	144	39	94	27	0	160	23	76	14	0	113	537
11:15 AM	17	88	3	0	108	2	80	49	0	131	34	83	17	0	134	31	89	23	0	143	516
11:30 AM	16	110	7	0	133	4	72	32	0	108	37	99	20	0	156	21	91	15	0	127	524
11:45 AM	18	109	4	0	131	8	83	40	0	131	25	81	30	0	136	34	100	16	0	150	548
Total	60	414	18	0	492	17	333	164	0	514	135	357	94	0	586	109	356	68	0	533	2125
12:00 PM	21	73	4	0	98	4	80	49	0	133	33	81	32	0	146	27	100	24	0	151	528
12:15 PM	12	85	4	0	101	9	98	38	0	145	32	68	26	0	126	35	86	19	Ō	140	512
12:30 PM	16	86	9	0	111	4	87	43	0	134	41	82	21	0	144	23	92	17	Ō	132	521
12:45 PM	15	91	3	0	109	8	71	51	0	130	38	50	21	0	109	37	90	20	Ō	147	495
Total	64	335	20	0	419	25	336	181	0	542	144	281	100	0	525	122	368	80	0	570	2056
rand Total	124	749	38	0	911	42	669	345	0	1056	279	638	194	0	1111	231	724	148	0	1103	4181
Apprch %	13.6	82.2	4.2	0		4	63.4	32.7	0		25.1	57.4	17.5	0		20.9	65.6	13.4	0	-	
Total %	3	17.9	0.9	0	21.8	1	16	8.3	0	25.3	6.7	15.3	4.6	0	26.6	5.5	17.3	3.5	0	26.4	
Cars	123	741	37	0	901	42	651	341	0	1034	272	629	193	0	1094	229	707	145	0	1081	4110
% Cars.	99.2	-98.9	97.4	0	98.9	100	97.3	98.8	0	97.9	97.5	98.6	99.5	0	98.5	99.1	97.7	98	0	98	98.3
eavy Vehicles	1	8	1	0	10	Ö	18	4	0	22	7	9	1	0	17	2	17	3	0	22	71
6 Heavy Vehicles	8.0	1.1	2.6	0	1.1	0	2.7	1.2	0	2.1	2.5	1.4	0.5	0	1.5	0.9	2.3	2	0	2	1.7

			ngton S			IVI	t.Aubur		•	16)			ngton S			M	L.Aubur	n Street	(Route	16)	
			rom No	rth			F	rom Ea	st			F	rom Soi	uth			F	rom We	est		
Start Time	Right	Thru	Left		App. Total		Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
ak Hour Analy	sis Fron	11:00 A	M to 12	:45 PM -	Peak 1 of	1															
ak Hour fo	or Entire	e Inters	section	Begin	s at 11:0	MA 00															
11:00 AM	9	107	4	0	120	3	98	43	0	144	39	94	27	0	160	23	76	14	0	113	537
11:15 AM	17	88	3	0	108	2	80	49	0	131	34	83	17	0	134	31	89	23	0	143	516
11:30 AM	16	110	7	0	133	4	72	32	0	108	37	99	20	0	156	21	91	15	0	127	524
11:45 AM	18	109	4	0	131	8	83	40	0	131	25	81	30	0	136	34	100	16	0	150	548
otal Volume	60	414	18	0	492	17	333	164	0	514	135	357	94	0	586	109	356	68	0	533	2125
App. Total	12.2	84.1	3.7	0		3.3	64.8	31.9	0		23	60.9	16	0		20.5	66.8	12.8	0		
PHF	.833	.941	.643	.000	.925	.531	.849	.837	.000	.892	.865	.902	.783	.000	.916	.801	.890	.739	.000	.888	.969
Cars	60	409	18	0	487	17	325	161	0	503	132	352	93	0	577	109	348	66	0	523	2090
% Cars	100	98.8	100	0	99.0	100	97.6	98.2	0	97.9	97.8	98.6	98.9	0	98.5	100	97.8	97.1	0	98.1	98.4
leavy Vehicles	0	5	0	0	5	0	8	3	0	11	3	5	1	0	9	0	8	2	. 0	10	35
& Heave Vehicles	1 0	12	0	0	1.0	1 0	24	1.8	Ω	21	22	14	11	n	15	l n	22	29	Ω	10	1.6

28 Lord Road, Suite 280 Marlborough, MA 01752

'S: Arlington Street

W: Mt.Auburn Street (Route 16)

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 A

Site Code: 743

Start Date : 11/16/2013

٠.	onhe:	HHILEUP.	. ens	4110	DIKES
et	(Route	16)			Arlin

			rom No			IVIE			Koute	16)			igton S			Mt			: (Route	16)	
tart Time	D:							rom Ea				Fr	om Soi	uth			F	rom We	est		
tart Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	6	6	0	0	0	2	2	0	1	0	9	10	0	1	0	0	1	19
11:15 AM	0	0	0	7	7	0	1	0	3	4	0	0	0	8	8	Ō	'n	ñ	ñ	'n	19
11:30 AM	0	1	0	8	9	0	1	0	4	5	Ō	n	Ō	ä	8	n	1	0	7	8	30
11:45 AM	0	0	0	3	3	0	1	Ō	1	2	ñ	n	ñ	4	4	0	0	0	6		
Total	0	1	0	24	25	0	3	<u> </u>	10	13	0		- 0	29		0		0		6	15
,		•	Ü	۷,	20	U	5	U	10	13	U	t	U	29	30	0	2	0	13	15	83
12:00 PM	0	1	0	7	8	0	0	0	1	1	n	2	0	4	6	<u> </u>	2	Λ	2	4	19
12:15 PM	0	0	0	8	8	0	· 1	n	- 4	5	ñ	1	ñ	6	7	0	0	0	-		
12:30 PM	0	0	0	3	3	ñ	1	n	'n	1	1	2	0	6	9	0	0	0	5	5	25
12:45 PM	0	n	ñ	14	14	0	1	2	0	2	,1	- 4	U	0	9	U	2	U	3	5	18
									U	3	U	1	U	1	2	1	0	. 0	0	1	20
Total	0	1	0	32	33	0	3	2	5	10	1	6	0	17	24	1	4	0	10	15	82
rand Total	0	2	0	56	58	0	6	2	15	23	1	7	٥	46	54	۱ ،	c	_	00	20.1	405
Apprch %	O	3.4	n	96.6		0	26.1	8.7	65.2	23	10	12	0		54		6	0	23	30	165
Total %	_		0		25.0						1.9	13	U	85.2		3.3	20	0	76.7		
10(a) %	0	1.2	U	33.9	35.2	0	3.6	1.2	9.1	13.9	0.6	4.2	0	27.9	32.7	0.6	3.6	0	13.9	18.2	

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

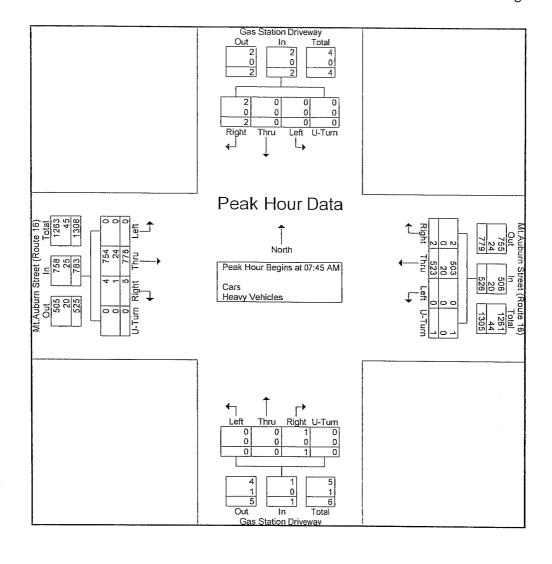
ity, State: Watertown, MA

lient: MDM/ C. Jones

File Name: 133646 BB

Site Code: 743

Start Date : 11/19/2013



28 Lord Road, Suite 280 Marlborough, MA 01752

/S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

ity, State: Watertown, MA

lient: MDM/ C. Jones

File Name: 133646 BB

Site Code: 743

Start Date : 11/19/2013

								Grou	ıps Prini	ted- Cars	s - Heavγ	Vehicle Vehicle	29								
				riveway	7	M	t.Auburn	Street	(Route	16)		Gas St	ation D	riveway	,	M	t.Auburr	Street	(Route	16)	
			rom No	rth	11022		F	rom Ea	st			Fr	om So	uth				rom We		,	
Itart Time	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	Ų-Tum	App. Total	Right	Thru	Left	U-Tum	App. Total	Int. Total
07:00 AM	0	0	0	0	0	2	84	0	0	86	0	0	0	0	0	n	179	1	0	180	266
07:15 AM	0	0	0	0	0	1	118	0	Ō	119	n	0	ñ	ñ	0	١	152	1	1	154	273
07:30 AM	1	0	0	0	1	2	111	Ō	Ō	113	n	n	1	n	1	1	195	0	Ó	196	
07:45 AM	1	0	0	0	1	1	127	Ō	Ö	128	Ö	0	Ó	0	0	'	221		-		311
Total	2	0	0	0	2	6	440	0	0	446	0	0	1	0	1	2	747	0 2	0	222	351
					_	•		Ū	J	110		U	1	U	1	. 2	141	Z	1	752	1201
08:00 AM	0	0	0	0	0	0	136	0	0	136	l o	0	0	0	0	2	202	0	0	204	340
08:15 AM	1	0	0	0	1	0	130	0	1	131	1	Ö	Õ	n	1	1	189	0	0		
08:30 AM	0	0	0	0	0	1	130	Ō	Ö	131	'n	0	0	0	'n	1	166	_	-	190	323
08:45 AM	1	0	0	0	1	1	124	Ö	Ö	125	1	n	1	0	2	Ó	178	0	0	167	298
Total	2	0	0	0	2	2	520	0	1	523	2	0	- 1	0	3				0	178	306
	_	•	•	Ū	-	_	020	U	•	020	_	U	ı	U	ا د	4	735	0	0	739	1267
rand Total	4	0	0	0	4	8	960	0	1	969	2	0	2	0	4	6	1482	2	1	1491	2468
Apprch %	100	0	0	0		8.0	99.1	0	0.1		50	0	50	0	·	0.4	99.4	0.1	0.1	1451	2400
Total %	0.2	0	0	0	0.2	0.3	38.9	0	0	39.3	0.1	ō	0.1	Ö	0.2	0.2	60	0.1	0.1	60.4	
Cars	4	0	0	0	4	7	908	0	1	916	2	0	1	0	3	4	1425	2	1	1432	2355
% Cars	100	0	0	0	100	87.5	94.6	Ō	100	94.5	100	Ö	50	0	75	66.7	96.2	100	100	96	
leavy Vehicles	0	0	0	0	0	1	52	0	0	53	0	0	1	0	1	20.7	57	0	0	59	95.4 113
& Heavy Vehicles	0	0	0	0	0	12.5	5.4	0	0	5.5	Ö	Ö	50	Ö	25	33.3	3.8	0	0	4	4.6
															,			_	_	٠,	7.0

				riveway	<i>r</i>	M	t.Auburi	n Street	(Route	16)		Gas St	ation D	riveway		Mi	.Auburi	Street	(Route	16)	
	ļ		rom No	rth			F	rom Ea	st			Fi	rom Sou	uth				rom We		,	
Start Time	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	A T-1-1	Int. Total
ak Hour Analy	sis Fron	1 07:45 A	M to 08	:30 AM -	Peak 1 of	1									147. 10.2.	7.191.1	- 11111	LUIL	O-Tuili	App. Total	IIIL TOTAL
ak Hour fo	or Entire	e Inters	section	Begin:	s at 07:4	5 AM															
07:45 AM	1	0	0	0	1	1	127	0	0	128	0	0	0	0	0.1	1	221	0	Ω	222	351
08:00 AM	0	0	0	0	0	0	136	0	0	136	0	0	0	Ō	n	9	202	n	0	204	340
08:15 AM	1	0	0	0	1	0	130	0	1	131	1	Ō	Ō	Õ	1	1	189	0	0	190	323
08:30 AM	0	0	0	0	0	1	130	0	0	131	0	0	Ō	Õ	'n	1	166	0	0	167	
otal Volume	2	0	0	0	2	2	523	0	1	526	1	0	0	0	1	5	778		0	783	<u>298</u> 1312
App. Total	100	0	0	0		0.4	99.4	0	0.2		100	Õ	Ô	Ô	•	0.6	99.4	0	0	103	1312
PHF	.500	.000	.000	.000	.500	.500	.961	.000	.250	.967	.250	.000	.000	.000	.250	.625	.880	000	000	000	00.4
Cars	2	Λ		· · · ·	2	2	503	.000			.200	.000.	.000	.000	.230	.025		.000	.000	.882	.934
	100	0	0	0	- 1			U	1	506		U	U	U	7	4	754	0	0	758	1267
% Cars	100	0	Ü	Ü	100	100	96.2	0	100	96.2	100	0	0	0	100	80.0	96.9	0	0	96.8	96.6
leavy Vehicles	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	. 1	24	Ō	Ō	25	45
6 Heavy Vehicles	0	0	0	0	0	0	3.8	0	0	3.8	0	0	0	0	0	20.0	3.1	0	Ô	3.2	3.4

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 BB

Site Code: 743

Start Date : 11/19/2013

Groups	Printed-	Peds	and	Bikes	

								G	roups i	rintea- F	'eas and	Bikes									
			tation D		/	Mt	.Auburr	Street	(Route	16)		Gas St	ation D	riveway	,	M	t.Auburi	1 Street	(Route	16)	
			rom No	rth			F	rom Ea	st			F	rorn So	uth			F	rom We	est		
tart Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	2	2	0	1	0	1	2	0	0	0	7	7	0	1	0	0	1	12
7:15 AM	0	0	0	2	2	0	1	0	2	3	0	0	0	1	1	0	2	0	2	4	10
7:30 AM	0	0	0	8	8	0	1	0	1	2	0	0	0	8	8	0	1	0	1	2	20
7:45 AM	0	0	0	3	3	0	3	0	1	4	0	0	0	7	7	Ō	0	Ō	1	1	15
Total	0	0	0	15	15	0	6	0	5	11	0	0	0	23	23	0	4	0	4	8	57
08:00 AM	0	0	0	1	1	0	2	0	0	2	0	0	0	20	20	0	4	0	0	4	27
08:15 AM	0	0	0	6	6	0	3	0	4	7	0	0	0	11	11	0	2	0	0	2	26
08:30 AM	0	0	0	3	3	0	2	0	2	4	0	0	0	15	15	0	4	0	0	4	26
08:45 AM	0	0	0	3	3	0	2	0	0	2	0	0	0	14	14	0	5	0	0	5	24
Total	0	0	0	13	13	0	9	0	6	15	0	0	0	60	60	0	15	0	0	15	103
rand Total	0	0	0	28	28	0	15	0	11	26	0	0	0	83	83	0	19	0	4	23	160
Apprch %	0	0	0	100		0	57.7	0	42.3		0	0	0	100		0	82.6	0	17.4		
Total %	0	0	0	17.5	17.5	0	9.4	0	6.9	16.2	0	0	0	51.9	51.9	0	11.9	0	2.5	14.4	

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

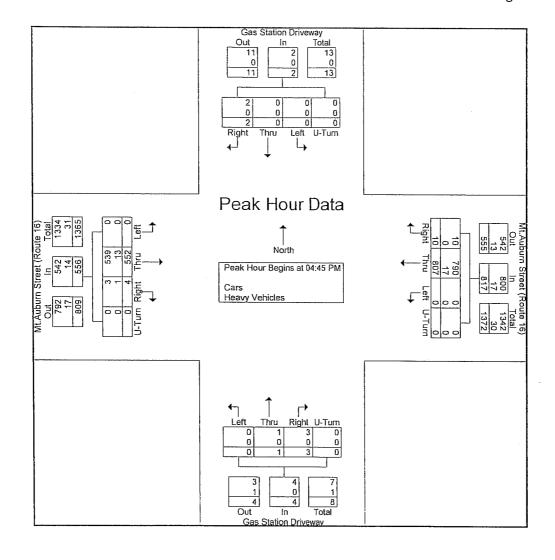
ty, State: Watertown, MA

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28 Lord Road, Suite 280 Marlborough, MA 01752

S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

ty, State: Watertown, MA

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Site Code: 743

Start Date : 11/19/2013

				rusti.				Grou	ps Prin	ted- Cars	- Heavy	/ Vehicle	es								
				riveway	<i>'</i>	M			(Route	16)				riveway	,	M	.Auburi	Street	(Route	16)	
- in-			om No	rth	~~~~			rom Ea	st			Fı	rom So	uth			F	rom We	est		
tart Time	Right	Thru	Left	U-Tum	App Total	Right	Thru	Left	U-Turn	App Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App. Total	Int. Total
04:00 PM	1	0	0	0	1	6	196	0	0	202	0	0	0	0	0	3	115	1	0	119	322
04:15 PM	1	0	0	0	1	3	199	0	0	202	0	0	0	0	0	0	126	0	0	126	329
04:30 PM	0	0	0	0	0	1	185	0	. 0	186	2	0	1	0	3	0	138	0	0	138	327
)4:45 PM	1	0	0	0	1	5	190	0	0	195	1	0	0	0	1	1	129	0	Ō	130	327
Total	3	0	0	0	3	15	770	0	0	785	3	0	1	0	4	4	508	1	0	513	1305
					,					,	•			_	- 1			•	Ū	0.0	1000
05:00 PM	1	0	0	0	1	2	205	0	0	207	0	0	0	0	0 '	l 0	142	0	0	142	350
05:15 PM	0	0	0	0	0	1	208	0	0	209	1	0	0	0	1	3	137	Ō	Ō	140	350
05:30 PM	0	0	0	0	0	2	204	0	0	206	1	1	Ō	Ö	2	o o	144	ñ	Ö	144	352
05:45 PM	0	0	0	0	0	1	179	0	0	180	0	0	Ō	Ö	ō	Ö	129	0	Ö	129	309
Total	1	0	0	0	1	6	796	0	0	802	2	1	0	0	3	3	552	0	0	555	1361
											. –		•	•	0 1	, ,	COL	Ü	Ü	000	1501
and Total	4	0	0	0	4	21	1566	0	0	1587	5	1	1	0	7	1 7	1060	1	0	1068	2666
Apprch %	100	0	0	0		1.3	98.7	0	0		71.4	14.3	14.3	Ô		0.7	99.3	0.1	n	1000	2000
Total %	0.2	0	0	0	0.2	8.0	58.7	0	ō	59.5	0.2	0	0	0	0.3	0.3	39.8	0.1	0	40.1	
Cars	4	0	0	0	4	21	1531	0	0	1552	5	1	1	0	7	6	1027		0	1034	2597
% Cars	100	0	0	0	100	100	97.8	Ö	ō	97.8	100	100	100	0	100	85.7	96.9	100	0	96.8	97.4
eavy Vehicles	0	0	0	0	0	0	35	0	0	35	0	0	0	0	0	1	33	0	0	34	69
Heavy Vehicles	0	0	. 0	0	0	0	2.2	0	Ō	2.2	ō	0	Õ	Õ	0	14.3	3.1	0	n	3.2	2.6
•					- 1			-	-			_	•	•	0	1 7.0	٠.١	U	U	J.Z	۷.پ

	!			niveway	/	IVI	t.Auburi			16)		Gas St	ation D	riveway		Mi	LAuburt	ı Street	(Route	16)	
	<u> </u>		rom No	rth			F	rom Ea	ıst			Fr	rom Soi	uth			F	rom We	st	•	
Start Time	Right	Thru	Left		App. Total		Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App. Total	Int. Total
ik Hour Analy																			- 10111	гур, гош	IIIC TOLL
ak Hour fo	or Entire	e Inters	section	Begin	s at 04:4	15 PM															
04:45 PM	1	0	0	0	1	5	190	0	0	195	1	0	0	0	1	1	129	0	0	130	327
05:00 PM	1	0	0	0	1.	2	205	0	0	207	0	0	0	0	0	0	142	0	0	142	350
05:15 PM	0	0	0	0	0	1	208	0	0	209	1	0	0	0	1	3	137	0	0	140	350
05:30 PM	0	0	0	0	0	2	204	0	0	206	1	1	0	0	2	0	144	0	0	144	352
otal Volume	2	0	0	0	2	10	807	0	0	817	3	1	0	0	4	4	552	0	0	556	1379
App. Total	100	0	0	0		1.2	98.8	0	0		75	25	0	0		0.7	99.3	0	0		
PHF	.500	.000	.000	.000	.500	.500	.970	.000	.000	.977	.750	.250	.000	.000	.500	.333	.958	.000	.000	.965	.979
Cars	2	0	0	0	2	10	790	0	0	800	3	1	0	0	4	3	539	0	0	542	1348
% Cars	100	0	0	0	100	100	97.9	0	0	97.9	100	100	0	0	100	75.0	97.6	0	0	97.5	97.8
eavy Vehicles	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	1	13	0	0	14	31
6 Heavy Vehicles	0	0	0	0	0	0	2.1	0	0	2.1	0	0	0	0	0	25.0	2.4	0	. 0	2.5	2.2

28 Lord Road, Suite 280 Marlborough, MA 01752

Groups Printed- Peds and Bikes

S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

ty, State: Watertown, MA ient: MDM/ C. Jones

File Name: 133646 BBB

Site Code: 743

Start Date : 11/19/2013

-							_	noups i	THILL CO. I		LINES								
	Gas Sta	tion D		,	Mi	.Auburr	Street		16)				riveway	7	Mt			(Route	16)
_		3111 140	1 (1)				TOILE	ISL	i		1	rom Soi	utn			F	rom We	est	
1	Thru	Left	Peds	App, Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. T
	0	0	6	6	0	1	0	3	4	0	0	0	2	2	0	0	<u> </u>	<u> </u>	
	0	0	2	2	0	3	0	1	4	0	0	0	0	0	0	Õ	Ō	Õ	

																			- J.	- 1	
tart Time	Right	Thru	Left	Peds	App, Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	6	6	0	1	0	3	4	0	0	0	2	2	0	0	<u> </u>		0	12
04:15 PM	0	0	0	2	2	0	3	0	1	4	0	Ō	Ō	0	0	n	0	ñ	ñ	ا م	6
04:30 PM	1	0	0	4	5	0	2	0	0	2	Ō	Ô	Ō	4	4	n	2	n	0	2	13
04:45 PM	0	0	0	6	6	0	2	0	2	4	0	Ô	Ō	5	5	n	ń	0	0	7	15
Total	1	0	0	18	19	0	8	0	6	14	0	0	0	11	11	0	2	0	0	2	46
05:00 PM	0	0	0	1	1	0	0	0	0	0	l o	0	0	6	6	0	2	Ω	0	2	9
05:15 PM	0	0	0	0	0	0	2	0	1	3	0	0	0	4	4	Ō	1	ñ	1	2	q
05:30 PM	0	0	0	3	3	0	3	0	0	3	Ō	Ō	Ō	3	3	n	2	n	Ċ	2	11
05:45 PM	0	0	0	6	6	0	3	0	2	5	ō	Ō	ō	8	8	Ô	1	o O	0	1	20
Total	0	0	0	10	10	0	8	0	3	11	0	0	0	21	21	0	6	0	1	7	49
rand Total	1	0	0	28	29	0	16	0	9	25	0	0	0	32	32	0	8	0	1	9	95
Apprch %	3.4	0	0	96.6		0	64	0	36		0	0	0	100		0	88.9	Ō	11.1	١	30
Total %	1.1	0	0	29.5	30.5	0	16.8	0	9.5	26.3	0	0	0	33.7	33.7	0	8.4	0	1.1	9.5	

28 Lord Road, Suite 280 Marlborough, MA 01752

'S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

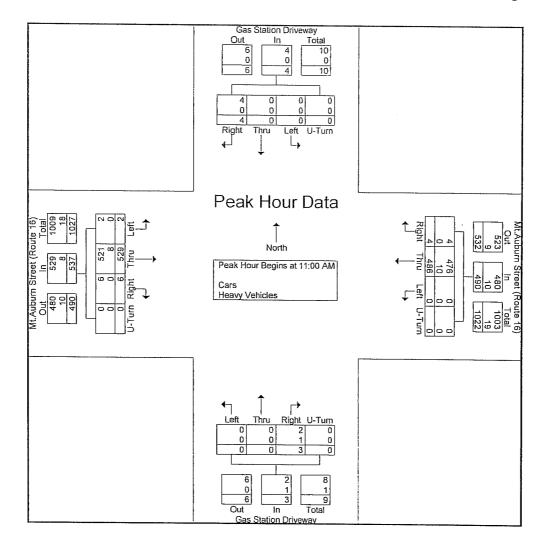
ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 B

Site Code: 743

Start Date : 11/16/2013



28 Lord Road, Suite 280 Marlborough, MA 01752

S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

ry, State: Watertown, MA

ent: MDM/ C. Jones

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Site Code: 743

Start Date : 11/16/2013

	Groups Printed- Cars - Heavy Vehicles Gas Station Driveway Mt.Auburn Street (Route 16) Gas Station Driveway Mt.Auburn Street (Route 16)																				
					/	M	t.Auburi	n Street	(Route	16)		Gas St	tation D	riveway	,	M	t.Auburr	Street	(Route	16)	Ì
			rom No	rth			F	rom Ea	st			F	rom Soi	uth	i		F	rom We	est	•	
art Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Tum	App Total	Int. Total
1:00 AM	0	0	0	0	0	0	140	0	0	140	0	0	0	0	0	3	115	0	0	118	258
1:15 AM	3	0	0	0	3	0	109	0	0	109	0	0	0	0	0	1	144	1	0	146	258
1:30 AM	0	0	0	0	0	2	104	0	0	106	0	0	0	0	0	1	127	0	0	128	234
1:45 AM	1	0	. 0	0	1	2	133	0	0	135	3	0	0	0	3	1	143	1	Ō	145	284
Total	4	0	0	0	4	4	486	0	0	490	3	0	0	0	3	6	529	2	0	537	1034
2:00 PM	2	0	0	0	2	1	132	0	0	133	2	0	0	0	2	1 1	152	0	0	153	290
2:15 PM	0	0	0	0	0	3	134	0	0	137	2	0	1	0	3	Ó	137	Ö	ñ	137	277
2:30 PM	0	0	0	0	0	2	125	0	0	127	0	0	0	Ō	Ō	1	133	Ö	Ö	134	261
2:45 PM	0	0	0	0	0	3	108	0	0	111	0	0	Õ	ō	o i	1	143	Ö	0	144	255
Total	2	0	0	0	2	9	499	0	0	508	4	0	1	0	5	3	565	0	0	568	1083
and Total	6	0	0	0	6	13	985	0	0	998	7	0	1	0	8	9	1094	2	0	1105	2117
Apprch %	100	0	0	0		1.3	98.7	0	0		87.5	0	12.5	0		0.8	99	0.2	0	. 100	
Total %	0.3	0	0	0	0.3	0.6	46.5	0	0	47.1	0.3	0	0	0	0.4	0.4	51.7	0.1	0	52.2	
Cars	6	0	0	0	6	13	964	0	0	977	6	0	1	0	7	9	1075	2	0	1086	2076
% Cars	100	0	0	0	100	100	97.9	0	0	97.9	85.7	0	100	Ō	87.5	100	98.3	100	0	98.3	98.1
avy Vehicles	0	0	0	0	0	0	21	0	0	21	1	0	0	0	1	0	19	0	0	19	41
Heavy Vehicles	0	0	0	0	0	0	2.1	Ó	0	2 1	14.3	Ω	0	n	12.5	آ ا	17	ñ	ñ	17	10

				riveway	,	M	Auburi	n Street	(Route	16)		Gas St	ation D	riveway		M	t.Aubur	Street	(Route	16)	
		F	rom No	rth			F	rom Ea	st			Fr	om Soi	uth			F	rom We	st		
Start Time	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Tum	App. Total	Right	Thru	Left	U-Tum	App. Total	Int. Total
k Hour Analy																		,-]		ripp. (didi	
ak Hour fo	r Entire	e Inters	section	Begin	s at 11:0	MA 00															
11:00 AM	0	0	0	0	0	0	140	0	0	140	0	0	0	0	0	3	115	0	0	118	258
11:15 AM	3	0	0	0	3	0	109	0	0	109	0	0	0	0	0	1	144	1	0	146	258
11:30 AM	0	0	0	0	0	2	104	0	0	106	0	0	0	0	0	1	127	0	0	128	234
11:45 AM	1	0	0	0	1	2	133	0	0	135	3	0	0	0	3	1	143	1	0	145	284
ptal Volume	4	0	0	0	4	4	486	0	0	490	3	0	0	0	3	6	529	2	0	537	1034
App. Total	100	0	0	0		0.8	99.2	0	0		100	0	0	0		1.1	98.5	0.4	0		
PHF	.333	.000	.000	.000	.333	.500	.868	.000	.000	.875	.250	.000	.000	.000	.250	.500	.918	.500	.000	.920	.910
Cars	4	0	0	0	4	4	476	0	0	480	2	0	0	0	2	6	521	2	0	529	1015
% Cars	100	0	0	0	100	100	97.9	0	0	98.0	66.7	0	0	0	66.7	100	98.5	100	Ō	98.5	98.2
eavy Vehicles	0	0	0	0	0	0	10	0	0	10	1	0	0	0	1	0	8	Ō	0	8	19
Heavy Vehicles	0	0	0	0	0	0	2.1	0	0	2.0	33.3	0	0	0	33.3	0	1.5	Ω	Ω	15	1.8

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Gas Station / Gas Station Driveway

W: Mt.Auburn Street (Route 16)

ity, State: Watertown, MA

lient: MDM/ C. Jones

File Name: 133646 B

Site Code: 743

Start Date : 11/16/2013

	Groups Printed-	Peds	and	Bikes
Mt.Auburn Stre	et (Route 16)			Gas S

									посро г	THILL CO. I	cus anu	Dives									
				riveway	/	M	t.Auburr			16)		Gas Sta	ation D	riveway	7	M	t.Auburr	Street	(Route	16)	
			rom No				F	rom Ea	st			Fr	om So	uth				rom We		,	
tart Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
11:00 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	16	16	0	3	0	1	4	22
11:15 AM	0	0	0	10	10	0	1	0	0	1	0	0	Õ	10	10	n	ñ	n	'n	Ů,	21
11:30 AM	0	0	0	3	3	0	0	0	2	2	0	Õ	Õ	14	14	n	1	ñ	0	1	20
11:45 AM	0	0	0	1	1	0	1	Ō	4	5	ñ	ñ	n	5	5	0	3,	0	0	3	
Total	0	0	0	16	16	0	2	0	6	8	0	<u>_</u>		45	45	0		- 0	- 0	8	77
•	•						_	·	J	0	U	U	U	40	40	ı	,	U	ı	٥	//
12:00 PM	0	0	0	9	9	0	1	0	2	3	0	0	0	9	9	l n	3	Ο	Λ	3	24
12:15 PM	0	0	0	7	7	0	1	0	5	6	0	Ō	Ō	15	15	l ñ	ñ	ñ	1	1	29
12:30 PM	0	0	0	2	2	0	1	0	3	4	Ō	Ō	ñ	7	7	n	4	n	'n	4	17
12:45 PM	0	0	0	15	15	0	1	0	Ō	1	n	ñ	ñ	12	12	١	2	0	1	2	31
Total	0	0	0	33	33	0	4	0	10	14	0	0	0	43	43	0	9	0	- 1	11	
	•		_				•	ŭ			U	U	U	73	40	, 0	5	U	2	111	101
rand Total	0	0	0	49	49	0	6	0	16	22	0	0	0	88	88	1 0	16	0	3	19	178
Apprch %	0	0	0	100		0	27.3	0	72.7		0	0	0	100		Ö	84.2	0	15.8	'5	,,,
Total %	0	0	0	27.5	27.5	0	3.4	0	9	12.4	0	ō	Ō	49.4	49.4	٥	9	0	17	10.7	

28 Lord Road, Suite 280 Marlborough, MA 01752

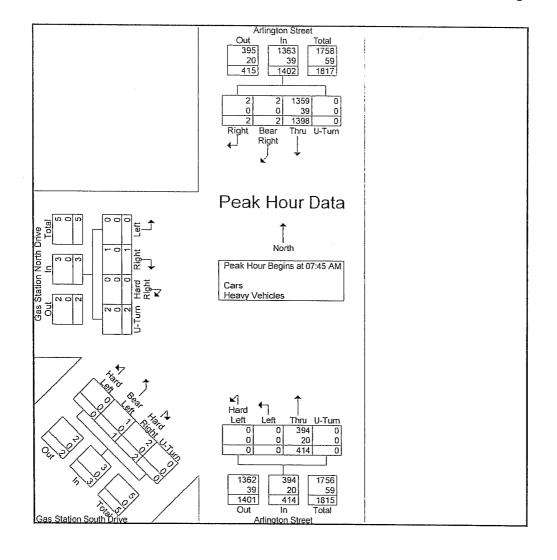
S: Arlington Street

/SW:Gas Station North/Gas Station South

ty, State: Watertown, MA ient: MDM/ C. Jones File Name: 133646 CC

Site Code: 743

Start Date : 11/19/2013



28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

/SW:Gas Station North/Gas Station South

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 CC

Site Code: 743

Start Date : 11/19/2013

										nted- Cars	- Heav	y Vehic	les								
			ngton 5					ington S						outh Driv	/e				rth Driv	re e	
		F	rom No	rth		ļ	F	rom So	uth	,		Fro	m Sout	hwest			F	rom W	est		
art Time	Right	Bear Right	Thru	U-Tum	App Total	Thru	Left	Hard Left	U-Tum	App. Total	Hard Right	Bear Left	Hard Left	U-Tum	App Total	haro Righi	Right	Left	U-Tum	App Total	Int. Total
7:00 AM	0	1	303	0	304	59	0	0	0	59	1	0	0	0	1	0	0	1	0	1	365
7:15 AM	0	0	320	0	320	83	2	0	0	85	0	1	0	0	1	0	1	1	0	2	408
7:30 AM	1	0	360	0	361	78	1	0	0	79	0	0	0	0	0	0	1	0	0	1	441
7:45 AM	0	0	360	0	360	88	0	0	0	88	0	0	0	0	0	0	0	0	0	0	448
Total	1	1	1343	0	1345	308	3	0	0	311	1	1	0	0	2	0	2	2	0	4	1662
20.00 414		,	254		050			_	_			_	_	_							
08:00 AM	0	1	351	0	352	91	0	Ü	0	91	0	0	0	0	0	0	0	0	0	0	443
08:15 AM	2	1	350	0	353	114	0	0	0	114	1	1	0	0	2	0	1	0	2	3	472
08:30 AM	0	0	337	0	337	121	0	0	0	121	1	0	0	0	1	0	0	0	0	0	459
08:45 AM	0	2	292	0	294	83	0	0	0	83	0	_ 1	0	0	1	0	0	0	1	1	379
Total	2	4	1330	0	1336	409	0	0	0	409	2	2	0	0	4	0	1	0	3	4	1753
rand Total	3	5	2673	0	2681	717	3	0	0	720	3	3	0	Λ	6	0	2	2	3	8 أ	3415
Apprch %	0.1	0.2	99.7	0	200,	99.6	0.4	0	0	120	50	50	0	0	١	0	37.5	25	37.5	0	3415
Total %	0.1	0.1	78.3	0	78.5	21	0.1	0	0	21.1	0.1	0.1	0	0	0.2	0	0.1	0.1		0.0	
Cars	3	5	2599	0	2607	690	0.1	0	0	690	3	2	0	0	5		0.1	2	0.1	0.2	3308
% Cars	100	100	97.2	0	97.2	96.2	0	0	0	95.8	100	66.7	0	0	83.3	0	33.3	100	100	75	96.9
eavy Vehicles	0	0	74	0	74	27	3	0	0	30	0.00	1	0	- 0	1	0	23.3	0	100	73	107
Heavy Vehicles	0	0	2.8	0	2.8	3.8	100	ō	0	4.2	ő	33.3	0	0	16.7	Ö	66.7	0	0	25	3.1

			rom No		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			ngton Sor					ition So m South	uth Driv west	/e			tion No rom We	rth Driv est	e	
Start Time	Right		Thru	U-Tum	App. Total	Thru	Left	Hard Left	U-Tum	App. Total	Hard Right	Bear Left	Hard Left	U-Tum	App. Total	Hard Rintu	Right	Left	U-Tum	App. Total	int, Total
ik Hour Analy	sis Fron	07:00 A	80 of MA	:45 AM -	Peak 1 of	1															
ak Hour fo	r Entire	e Inters	section	Begin	s at 07:4	15 AM															
07:45 AM	0	0	360	0	360	88	0	0	0	88	0	0	0	0	0	0	0	0	0	0	448
MA 00:80	0	1	351	0	352	91	0	0	0	91	0	0	0	0	0	0	0	0	0	0	443
D8:15 AM	2	1	350	0	353	114	0	0	0	114	1	1	0	0	2	0	1	0	2	3	472
08:30 AM	0	0	337	0	337	121	0	0	0	121	1	0	0	0	1	0	0	0	0	0	459
otal Volume	2	2	1398	0	1402	414	0	0	0	414	2	1	0	0	3	0	1	0	2	3	1822
App. Total	0.1	0.1	99.7	0		100	0	0	0		66.7	33.3	0	0		0	33.3	0	66.7		
PHF	.250	.500	.971	.000	.974	.855	.000	.000	.000	.855	.500	.250	.000	.000	.375	.000	.250	.000	.250	.250	.965
Cars	2	2	1359	0	1363	394	0	0	0	394	2	1	0	0	3	0	1	0	2	3	1763
% Cars	100	100	97.2	0	97.2	95.2	0	0	0	95.2	100	100	0	0	100	0	100	0	100	100	96.8
eavy Vehicles	0	0	39	0	39	20	0	0	0	20	0	0	0	0	0	0	0	0	0	0	59
ն Heavy Vehicles	ļ 0	0	2.8	0	2.8	4.8	0	0	0	4.8	0	0	0	0	0	0	0	0	0	0	3.2

28 Lord Road, Suite 280 Mariborough, MA 01752

S: Arlington Street

/SW:Gas Station North/Gas Station South

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 CC

Site Code: 743

Start Date : 11/19/2013

Groups	Printed-	Peds	and l	Bikes	
Arlington Street		Ī	G	as St	2

									sroups i	-mntea- P	eas and	BIKES									
İ			ington S					ington S				Gas Sta	tion So	uth Driv	/e		Gas Sta	tion No	rth Driv	'e	
		F	rom No	rth			F	rom So	uth			Fro	n South	rwest			F	rom We	est		
art Time	Right	Bear Right	Thru	Peds	App Total	Thru	Left	Hardtefi	Peds	App Total	Hard Roots	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Left	Peds	App. Total	Int. Total
7:00 AM	0	0	0	4	4	8	0	0	0	8	0	0	0	3	3	0	0	0	1	1	16
7:15 AM	0	0	2	0	2	14	0	0	0	14	0	0	0	0	0	0	Ō	Ō	Ò	'n	16
7:30 AM	0	0	1	4	5	8	0	0	0	8	0	0	0	1	1	Ō	Ô	0	1	1	15
7:45 AM	0	0	2	10	12	7	0	0	0	7	0	1	Õ	3	4	o o	Ô	o o	2	2	25
Total	0	0	5	18	23	37	0	0	0	37	0	1	0	7	8	0	0	0	4	4	72
08:00 AM	0	0	5	10	15	3	0	0	0	3	0	0	0	0	01	0	0	0	0	οl	18
08:15 AM	0	0	1	9	10	1	0	0	0	1	0	0	0	0	0	0	0	Ô	Ō	ñ	11
08:30 AM	0	0	2	10	12	0	0	0	0	0	0	0	0	0	0	Ō	Ō	Ô	Ō	ñ	12
08:45 AM	0	0	3	3	6	0	0	0	0	0	0	0	0	2	2	Ō	Õ	Õ	o o	ñ	8
Total	0	0	11	32	43	4	0	0	0	4	0	0	0	2	2	0	0	0	0	0	49
and Total	0	0	16	50	66	41	0	0	0	41	0	1	0	9	10	0	0	0	4	4	121
Apprch %	0	0	24.2	75.8	1	100	0	0	0		0	10	0	90	İ	0	0	0	100		
Total %	0	0	13.2	41.3	54.5	33.9	0	0	0	33.9	0	8.0	0	7.4	8.3	0	Ō	0	3.3	3.3	

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

/SW:Gas Station North/Gas Station South

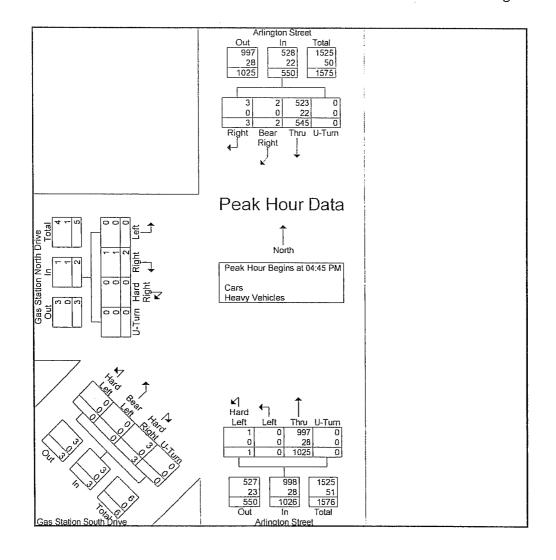
ty, State: Watertown, MA

ent: MDM/ C. Jones

File Name: 133646 CCC

Site Code: 743

Start Date : 11/19/2013



28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

/SW:Gas Station North/Gas Station South

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 CCC

Site Code: 743

Start Date : 11/19/2013

	Groups Printed- Cars - Heavy Vehicles Arlington Street Arlington Street Gas Station South Drive Gas Station North Drive From North From South From Southwest From West																				
											(/e					/e	
		F	rom No	rth			F	rom So	uth	,		Fro	m South	west			F	rom W	est		
art Time	Right	Bear Right	Thru	U-Tum	App Total	Thru	Left	Hard Left	U-Tum	App. Total	Hard Right	Bear Left	Hara Left	U-Tum	App Total	Hard Right	Right	Left	U-Tum	App. Total	Int. Total
4:00 PM	1	0	132	0	133	240	0	0	0	240	. 0	0	0	0	0	0	0	1	0	1	374
4:15 PM	0	0	161	0	161	255	0	0	0	255	1	0	0	0	1	0	0	0	0	0	417
4:30 PM	1	0	137	0	138	249	1	1	0	251	0	0	0	0	0	0	0	0	0	0	389
4:45 PM	1	1	132	0	134	251	0	0	0	251	0	0	0	0	0	0	0	0	0	0	385
Total	3	1	562	0	566	995	1	1	0	997	1	0	0	0	1	0	0	1	0	1	1565
5:00 PM	0	0	140	0	140	272	0	1	0	273	2	0	0	0	2	0	0	0	0	0	415
5:15 PM	1	0	138	0	139	259	0	0	0	259	0	0	0	0	0	0	2	0	0	2	400
5:30 PM	1	1	135	0	137	243	0	0	0	243	1	0	0	0	1	0	0	0	0	0	381
5:45 PM	0	0	152	0	152	213	0	0	0	213	1	0	0	0	1	0	0	0	0	0	366
Total	2	1	565	0	568	987	0	1	0	988	4	0	0	0	4	0	2	0	0	2	1562
and Total	5	2	1127	0	1134	1982	1	2	0	1985	5	0	0	0	5	0	2	1	0	3	3127
Apprch %	0.4	0.2	99.4	0		99.8	0.1	0.1	0		100	0	0	0		0	66.7	33.3	0		
Total %	0.2	0.1	36	0	36.3	63.4	0	0.1	0	63.5	0.2	0	0	0	0.2	0	0.1	0	0	0.1	
Cars	5	2	1087	0	1094	1932	1	2	0	1935	5	0	0	0	5	0	1	1	0	2	3036
% Cars	100	100	96.5	0	96.5	97.5	100	100	0	97.5	100	0	. 0	0	100	0	50	100	0	66.7	97.1
avy Vehicles	0	0	40	0	40	50	0	0	0	50	0	0	0	0	0	0	1	0	0	1	91
Heavy Vehicles	0	0	3.5	.0	3.5	2.5	0	0	0	2.5	0	0	0	0	0	0	50	0	0	33.3	2.9

			ington S					ngton S						uth Driv	/e		Gas Sta	tion No	orth Driv	re	
		F	rom No	rth			F	rom So	uth			Fro	m Soutl	nwest			F	rom We	est		
Start Time	Right	Bear Right	Thru	U-Tum	App. Total	Thru	Left	Hard Left	U-Tum	App. Total	Hard Right	Bear Left	Hard Left	U-Tum	App. Total	Hard Right	Right	Left	U-Tum	App, Total	Int. Total
ak Hour Analy	sis Fron	n 04:45 F	PM to 05	:30 PM -	Peak 1 of	1															
ak Hour fo	or Entire	e Inters	section	Begin	s at 04:4	15 PM															
04:45 PM	1	1	132	0	134	251	0	0	0	251	0	0	0	0	0	0	0	0	0	0	385
05:00 PM	0	0	140	0	140	272	0	1	0	273	2	0	0	0	2	0	0	0	. 0	0	415
05:15 PM	1	0	138	0	139	259	0	0	0	259	0	0	0	0	0	0	2	0	0	2	400
05:30 PM	1	1	135	0	137	243	0	0	0	243	1	0	0	0	1	0	0	0	0	0	381
otal Volume	3	2	545	0	550	1025	0	1	0	1026	3	0	0	0	3	0	2	0	0	2	1581
App. Total	0.5	0.4	99.1	0		99.9	0	0.1	0		100	0	0	0		0	100	0	0		
PHF	.750	.500	.973	.000	.982	.942	.000	.250	.000	.940	.375	.000	.000	.000	.375	.000	.250	.000	.000	.250	.952
Cars	3	2	523	0	528	997	0	1	0	998	3	0	0	0	3	0	1	0	0	1	1530
% Cars	100	100	96.0	. 0	96.0	97.3	0	100	0	97.3	100	0	0	0	100	0	50.0	0	0	50.0	96.8
leavy Vehicles	0	0	22	0	22	28	0	0	0	28	0	0	0	0	0	0	1	0	0	1	51
% Hoavy Vehicles	0	0	4.0	0	4.0	2.7	0	0	0	2.7	0	0	0	0	0	0	50.0	0	. 0	50.0	3.2

28 Lord Road, Suite 280 Marlborough, MA 01752

S: Arlington Street

/SW:Gas Station North/Gas Station South

ty, State: Watertown, MA

ient: MDM/ C. Jones

File Name: 133646 CCC

Site Code: 743

Start Date : 11/19/2013

Groups	Printed-	Peds	and	Bikes
--------	----------	------	-----	-------

									noups i	-milea- P	eus and	5 Bixes									
j			ngton S				Arli	ngton S	Street			Gas Sta	ition So	uth Driv	/e		Gas Sta	tion No	orth Driv	re	
		F	rom No	rth			F	rom So	uth			Fro	m Soutl	ıwest			F	rom We	est		
art Time	Right	Sear Right	Thru	Peds	App Total	Thru	Left	Hard Left	Peds	App. Total	Hald Right	Bear Left	Hard Left	Peds	App. Total	hard Right	Right	Left	Peds	App. Total	Int. Total
)4:00 PM	0	0	0	5	5	0	0	0	0	0	0	0	0	2	2	0	0	0	1	1	8
)4:15 PM	0	0	0	3	3	0	0	0	0	0	0	0	0	4	4	0	0	0	5	5	12
14:30 PM	0	0	0	5	5	0	0	0	0	0	0	0	0	Ô	0	O	Ō	Ō	Õ	Ō	5
)4:45 PM	0	0	0	5	5	1	0	0	0	1	Ō	Ō	Ō	1	1	Ö	Õ	Õ	1	1	8
Total	0	0	0	18	18	1	0	0	0	1	0	0	0	7	7	0	0	0	7	7	33
5:00 PM	0	0	0	5	5	1	0	0	0	1 1	0	0	0	1	1	0	0	0	1	1 '	8
05:15 PM	0	0	0	8	8	7	0	0	0	7	0	Ō	Ō	2	2	0	Ŏ	Õ	1	1	18
5:30 PM	0	0	1	3	4	1	0	0	0	1	0	Ō	0	1	1	n	Ö	Ô	1	1	7
)5:45 PM	0	0	3	5	8	1	0	0	0	1	0	0	0	4	4	0	Ö	Ō	4	4	17
Total	0	0	4	21	25	10	0	0	0	10	0	0	0	8	8	0	0	0	7	7	50
rand Total	0	0	4	39	43	11	0	0	0	11	0	0	0	15	15	0	0	0	14	14	83
Apprch %	0	0	9.3	90.7		100	0	0	0		0	0	0	100		0	0	0	100		
Total %	0	0	4.8	47	51.8	13.3	0	0	0	13.3	0	0	0	18.1	18.1	0	Ō	Ō	16.9	16.9	

28 Lord Road, Suite 280 Marlborough, MA 01752

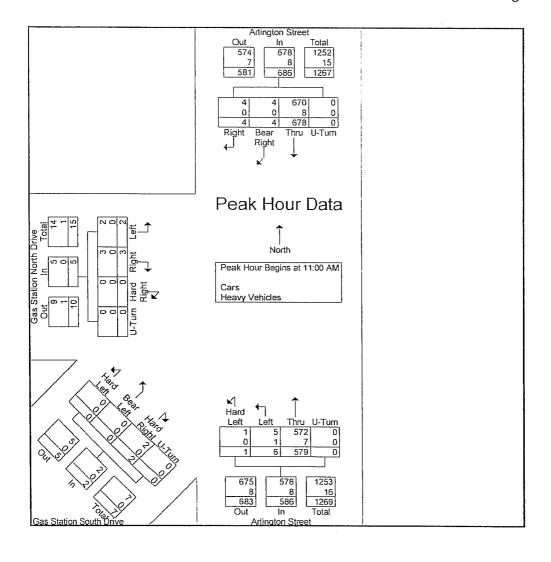
S: Arlington Street

/SW:Gas Station North/Gas Station South

ty, State: Watertown, MA ient: MDM/ C. Jones File Name: 133646 C

Site Code: 743

Start Date : 11/16/2013



28 Lord Road, Suite 280 Marlborough, MA 01752

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Page No : 1

Gas Station North Drive

	Cioups i miteu ouis	 y vemeres
7	Arlington Street	Gas Station South Drive

		F	rom No	rth			Fi	rom Soi	uth			Froi	m South	nwest			F	rom We	est		
art Time	Right	Bear Right	Thru	U-Tum	App. Tetal	Thru	Left	Hard Left	U-Tum	App Total	Hard Right	Bear Left	Hard Left	U-Tum	App Total	Hard Right	Right	Left	U-Tum	App. Total	Int. Total
1:00 AM	1	0	173	0	174	156	1	0	0	157	1	0	0	0	1	0	1	0	0	1	333
1:15 AM	0	0	168	0	168	136	0	1	0	137	0	0	0	0	0	0	0	1	0	1	306
1:30 AM	1	1.	159	0	161	151	1	0	0	152	0	0	0	0	0	0	0	0	0	0	313
1:45 AM	2	3	178	0	183	136	4	0	0	140	1	0	0	0	1	0	2	1	0	3	327
Total	4	4	678	0	686	579	6	1	0	586	2	0	0	0	2	0	3	2	0	5	1279
2:00 PM	1	3	145	0	149	134	1	0	0	135	2	2	0	0	4	0	0	0	0	0	288
2:15 PM	1	2	154	0	157	120	0	0	0	120	0	1	0	0	1	0	0	0	0	0	278
2:30 PM	1	0	154	0	155	130	0	0	0	130	0	0	0	0	0	0	0	0	0	0	285
2:45 PM	1	0	175	0	176	107	0	0	0	107	1	3	0	0	4	0	0	0	0	0	287
Total	4	5	628	0	637	491	1	0	0	492	3	6	0	0	9	0	0	0	0	0	1138
and Total	8	9	1306	0	1323	1070	7	1	0	1078	5	6	0	0	11	0	3	2	0	5	2417
Apprch %	0.6	0.7	98.7	0		99.3	0.6	0.1	0		45.5	54.5	0	0		0	60	40	0		
Total %	0.3	0.4	54	0	54.7	44.3	0.3	0	0	44.6	0.2	0.2	0	0	0.5	0	0.1	0.1	0	0.2	
Cars	8	9	1293	0	1310	1055	6	1	0	1062	5	6	0	0	11	0	3	2	0	5	2388
% Cars	100	100	99	0	99	98.6	85.7	100	0	98.5	100	100	0	0	100	0	100	100	0	100	98.8
eavy Vehicles	0	0	13	0	13	15	1	0	0	16	0	0	0	0	0	0	0	0	0	0	29
Home Vehicles	1 0	0	1	0	1	14	14.3	0	0	1.5	lΩ	Ω	Ω	0	0	1 0	0	n	0	0	12

			ngton 5					ngton S rom So				Gas Sta Fror	tion So n South		ve		Gas Sta	tion No rom We		re	
Start Time	Right	Bear Right	Thr⊔	U-Tum	App. Total	Thru	Left	Hard Left	U-Tum	App, Total	Hard Right	Bear Left	Hard Left	U-Tum	App, Total	Hard Right	Right	Left	U-Tum	App. Total	Int. Total
ak Hour Analy																					
ak Hour fo	or Entire	e Inters	section	Begin	s at 11:0	MA 00															
11:00 AM	1	0	173	0	174	156	1	0	0	157	1	0	0	0	1	0	1	0	0	1	333
11:15 AM	0	0	168	0	168	136	0	1	0	137	0	0	0	0	0	0	0	1	0	1	306
11:30 AM	1	1	159	0	161	151	1	0	0	152	0	0	0	0	0	0	0	0	0	0	313
11:45 AM	2	3	178	0	183	136	4	0	0	140	1	0	0	0	1	0	2	1	0	3	327
otal Volume	4	4	678	0	686	579	6	1	0	586	2	0	0	0	2	0	3	2	0	5	1279
App. Total	0.6	0.6	98.8	0		98.8	1	0.2	0		100	0	0	0		0	60	40	0		
PHF	.500	.333	.952	.000	.937	.928	.375	.250	.000	.933	.500	.000	.000	.000	.500	.000	.375	.500	.000	.417	.960
Cars	4	4	670	0	678	572	5	1	0	578	2	0	0	0	2	0	3	2	0	5	1263
% Cars	100	100	98.8	0	98.8	98.8	83.3	100	0	98.6	100	0	0	0	100	0	100	100	0	100	98.7
leavy Vehicles	0	0	8	0	8	7	1	0	0	8	0	0	0	0	0	. 0	0	0	0	0	16
K Mazur Vahides	1 0	0	12	0	1.2	12	16.7	0	0	1.4	0	0	0	0	0	. 0	0	n	Ο	0	13

MDM TRANSPORTATION CONSULTANTS, INC. 28 Lord Road, Suite 280

Marlborough, MA 01752

S: Arlington Street

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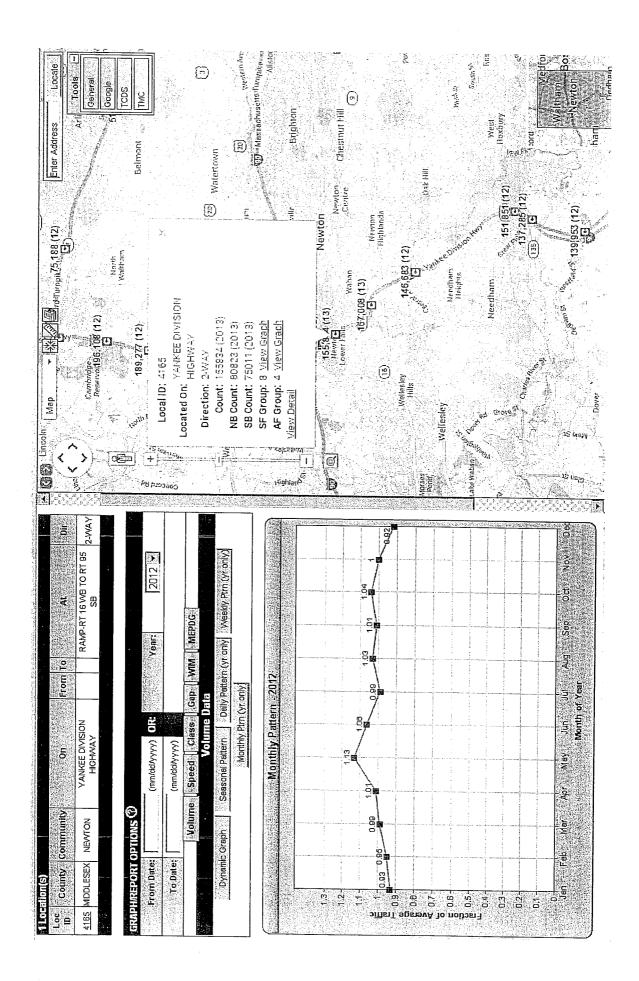
Groups	Print	ed- Pec	is and	Bikes	

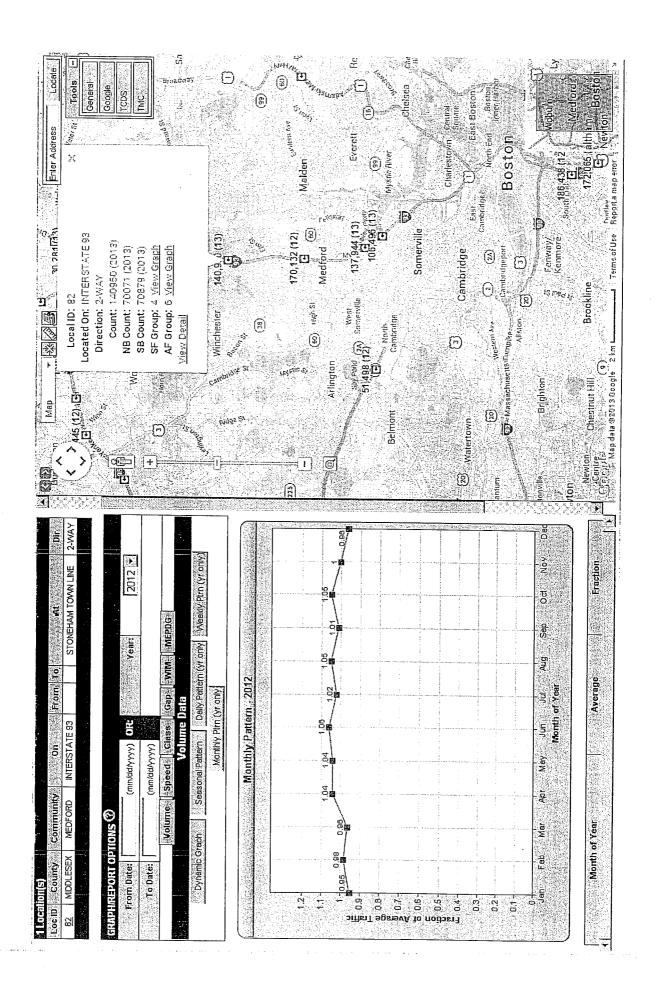
										rinteg. F	eas and	Dikes									
			ington S		İ			ngton S				Gas Sta	tion Sc	outh Driv	/e		Gas Sta	tion No	orth Driv	/e	Ì
	<u> </u>	1	rom No	rth			F	rom So	uth			Fro	m Sout	hwest			F	rom W	est		
art Time	Right	Bear Right	Thru	Peds	App Total	Thru	Left	Hard Left	Peds	App Total	Hara Fight	Bear Left	Hard Left	Peds	App Total	Hard Right	Right	Left	Peds	App. Total	Int. Total
1:00 AM	0	0	0	9	9	1	0	0	0	1	0	0	0		2	n	0	0	1	<u>' 1</u>	13
1:15 AM	0	0	0	5	5	0	0	0	0	0]	Ō	Ō	ñ	4	4	. 0	0	0	,	1	13
1:30 AM	0	0	0	4	4	0	0	0	Ō	أما	2	ñ	0	5	7	0	0	0	4	4	15
1:45 AM	0	0	0	4	4	0	Õ	Ö	0	ñ	ō	0	0	3	3	n	0	0	4	4	11
Total	0	0	0	22	22	1	0	0	0	1	2	0	0	14	16	0	0	0	13	13	52
2:00 PM	1 0	0	1	4	5	0	0	0	0	ا۵	0	Ω	n	3	3	0	0	0	2	2	10
2:15 PM	0	0	0	1	1	2	Õ	ñ	n	2	n	ñ	n	0	9	0	0	0	2	3	10
2:30 PM	0	0	0	4	4	3	Ō	ñ	n	3	n	n	n	5	5	0	0	0	3	3	15
2:45 PM	0	0	3	1	4	3	Ô	ñ	n	3	0	n	n	3	3	0	0	0	4	4	16
Total	0	0	4	10	14	8	0	0	0	8	0	0	0	20	20	0	0	0	9	9	10 51
and Total	0	0	4	32	36	9	0	0	0	9	2	Ω	Λ	34	36	0	0	0	22	22	400
Apprch %	0	0	11.1	88.9		100	Ô	0	n		5.6	n	0	94.4	30	0	0	-		22	103
Total %	0	Ō	3.9	31.1	35	8.7	0	0	0	8.7	1.9	0	n	33	35	0	0	0	100	21.4	
'		_			,			-	J	0.7	1.5	U	U	55	55	U	U	0	21.4	21.4	

		· ·

□ Seasonal Data

	4		





□ Crash Data



INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Watertown	, MA			COUNT DA	TE:	Nov-13
DISTRICT: 6	UNSIGN	IALIZED :		SIGNA	LIZED :	Х
		~ IN1	TERSECTION	N DATA ~		
MAJOR STREET:	Mount Aubur	n Street (Rou	te 16)			
MINOR STREET(S):	Arlington Str	eet				
	↑		Arlingto:			41600.00
INTERSECTION DIAGRAM (Label Approaches)	North [Mt Auburn Str (3)	reet	N	/It Auburn Str (4)	eet
			Arlingto (´	n Street 1)		
			PEAK HOU	R VOLUMES		
APPROACH:	1	2	3	4	5	Total Peak Hourly
DIRECTION:	NB	SB	EB	WB		Approach Volume
PEAK HOURLY VOLUMES (PM) :	1,041	398	569	686		2,694
"K" FACTOR:	0.090	INTERS		(V) = TOTA H VOLUME :	AL DAILY	29,933
TOTAL # OF CRASHES :	12	# OF YEARS :	3	CRASHES	GE#OF PERYEAR():	4.00
CRASH RATE CALCU	LATION :	0.37	RATE =	(A * 1,0	000,000) * 365)	
Comments : MassDOT	District 6 Avg	s: Signalized	= 0.76, Unsig	nalized = 0.5	8	
Project Title & Date:	743 - Watert	own (Walgree	ens)			

mas.	TOO!	Mass	OT Cre	MassDOT Crash Report for WATERTOWN for the year 2009	for WA	TERTO	WN for t	he year 20	600												
# Klimber	Chy/Town Name	Crash Cyle	Const Time	Crast Sevanty	Number of Velicies	Total Tol Norderal Feb Hutter Inju	in interest of	Cofean	Table Charles Charle	/encla Trava Directions	Oracione Most Harmful Events	Vahtas Contguraton	Road Surfece Condition Amb	Ant Light W	leather Corollan	al Readway Intersection	Roof Succession Colorest Day Colorest Day Colorest Day Colorest Col	Plane from	Distance from	Delanos from Magrost	North Models Type
1743	WATERTOWN	19-Feb-7009	2 0-58 PM	WATERTOWN 19-Feb-3009 (8.58 PM Non-lala) Inlury		-	Angle		71: Tumina left	7. Southbound	VI; Collision with pedestrian Vt; Passanger car	Vt; Passanger car	hed bear	Dark - lighted roadway R	Rain	ARLINGTON STREET / MOUNT AUBURN STREET					#1-Pedestran
	WATERTOWN 06-ABY-2009 B 4B AM	06-Aur-2009) 9.48 AM	Property damage only (none triured)		0	Anale	. rv 157	VI: Travelling straight ahnod / VI:Ensibound / V	VI; Covering VI; Collection of traffic	VI: Colivian with metar webide in Italia / V2: Colivian with motor verticite in VI: Passenger car / Inafic	VI: Passenger car / V2 Passenger car	Dry Davligh		Claudy	MOUNT AUBURN STREET / ARLINGTON STREET					
5901	WATER COWN 29-Jun-2009 9-24 PM	29-Jun-2009) 9-24 PM	Property damage only (none Intured)	-	1	Single veh	ide crash VI	Single vehible crash VI: Travelling stratcht ahead VI: Morthbound		VI: Collision with carb	VI: Passenger car	Dan Dry road	Dark - tighted roadway	Clear		ARLHIGTON STREET / MOUNT AUBURH STREET				
521	WATERTOWN	D4-Nev-2005 00 00 AM	1 00 00 AM	Property demage only (none tolured)	_		Single vett	Single vehicle crash	Turning fell	pundises;()	VI. Collsion with other fired object (wall, building, funnel, ste.)	VI. Passenger car	(IRQ)	Dark - Hghted	Clear		MOUNT AUBJIRN STREET / ARLINGTON STREET				
	WATERTOWN	24-Dec-2005	9 1.09 PM	WATERTOWN 24-Dec-2009 1.09 PM Nan-laist Injury	-	0	Single veh	Single vehicle crash V1: Tuming left		Vt:Eastbound	Vt. Colision with pedesirian V1: Passenger car		Dry Daylight		Clear		ARENGTON STREET / MOUNT AUBURN STREET				P1 Podestrian

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	An Molesi Tina				
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	Nones				
	istance from Youngs.				
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	Chetanos (rom Hazost Ent				
	1525			-	
	Chilanos from Flaanskii Kilemarko				
	Society		es MT riGTON		ì
	i Piedrost		m Intersect		URN BTRE
	Delarus from Peannel Roschery mersection		20 feet W from Intersection MT AUBURN ST / 684 ARURGTON STREET		AOUNT AUBURN BTREET /
	<u> </u>	1338)	2.4.6		_ <u>\$</u>
	ny interace	MOUNT AUBLIAN STREET RIP 16 W / AMLINGTON		RN ST /	
	A Hoath	RIGURT A Rie 16 W STREET		MT AUBURN ST /	
	Condition				
	Weather	O Gear	į.	i	
	Roed Surince Codebin Value Codebin A Rockey Interection Interestical	Ę	- E	ā	Dark - lighted
	Ann	Davloh	Davlight	Davligh	Day
	Road Sur Condition	ě	AG.	ě	
		VI. Light track(van, mink-van, panel, pickup, sport ulidiy) with only four tres I V2. Light track(van, mink-van, panel, pickup, sport utility) with only pickup, sport utility) with only pickup, sport utility) with only pickup, sport utility)		ig C3 ge	VZ.Lepni panel. with cody
	Configuration	VI. Lühl fruckivan, mini-van, panel, pickup, aport ulifly) wil only frur ties I V2.Liphi ruckivan, mini-van, panel, pickup, sport ulifly) with only poil ties.	VI: Passenger car / V2:Passenger car / V3:Tractor/semi-trailer	V1: Passenger car / V2 Bus (seals for 7-15 people, including diver)	VI: Passenger car / V2.Lrpn: Iruck(van. mini-van. panel. pickup. sport villity) with only
	Mati Hamlul Evenia			V1; Pass in (seats to including	VI: Collision with motor VI: Passenger car I VZ.Lipin vehicle in Italia I VZ: Inzekyan, mini-van, panel. Collision with motor vehicle in pickup, sport villity) with only
		VI: Collision with motor vehicle in Iraffic / V2: Collision with motor vehicle in traffic	 Cohejon with motor rehote in trafic / V2. Collision with motor vehicle it raffic / V3. Collision with motor vehicle in traffic 	Vt.: Not reported / V2: Collision with motor vahicle in rafic	n motor 7V2: Xor vehicle
	Hermini E	VI: Collision with motor vehicle in Iraffic / V2: Collision with motor vehicles to refine	VI: Collesion with motor vehicle in traffic / V2; Collision with motor vehicle Iraffic / V3; Collision with motor vehicle motor vehicle in traffic	Vt. Not reported / V2. Collision with motor vahi	VI: Collusion with motor vehicle in Iralia / V2: Collision with motor vehi
		VI: Colin	V1: C Collin	VI: No Collei VV2, Eastbound Iraffic	N Sept
	Direction	,,		VZ,Easlbc	
	ede Travel	Westbount	V1.Westbound V2.Westbound V3.Westbound	V1:Eastbound	
	, A	I. Scwing or stopped in traffe VI.Westbound VZ.Tevelbound	VI. Tavelling straight ahead / VI. Westbound / VZ. Slowing or stopped in 1976 VI. Westbound / VZ. Westbound / VI. Mestbound / VI. Mestbound / VI. Mestbound / VI. Westbound / VII.		
	a Prior to C	stonbed i	straight at r slopped in or slopped	or stopped l	en / VZ. Tran
2010	enda Acie	1. Stowing o	11: Travelling straight ahead / 22:Slowing or slopped in Italic V3:Slowing or slopped in raffic	VI: Slowing or stopped in traffic / V2:Travelling straight ahead	VI: Turning left / V2:Traveling
year	, Legal	>,	>>~=		>
or the	nher of Co	Rearvend	Rearend	Sideswipe, same direction	1
OWN	dtel ntvries Ma	Re		Pig C	
TERT	Total Montatal Hunnes	0		9	
or WA	Number of Vehicles				
aport f	Seventy	Property damage only (none Injured)	Property damage only (nane injured)	Property damage only (none intured)	Property damage only (none
ash R	8	Property di only (none Injured)	Propert only (n	Property dar carly (none intured)	Propert anly (n
oT o	Coach Tun	1 05 PM	6 33 AM	3,30,74	
WassD	Part Part	Md 50 1 0102 wef OC // MOIEHIOM	3.Jul.2010	4.5ep.2010	
<u>=</u>		With 30	90 MM	WIR	
massDOT MassDOT Crash Report for WATERTOWN for the year 2010	And Table (1970-on Name Comb Date Count Time Count Several Values (1970-on Name Count Several Count	WATERIO	Property damente Ovy (out ovy	WATERTOWN 14.5ep.2010 13.30 PM	Property demographic (none cont.)
mas	Kumber	1001	0852	2032	
	1.5	- 9	曹	밁	ü

ma	10as	Mass	SDOT Cr.	ash Repo	rt for	WATE	RTOW	massDO7 MassDOT Crash Report for WATERTOWN for the year 2011	ear 2011												
Crosn Number	Chy/Town Hame	c Crash De	in Cosh Tim	e Crair Serent	QUAN 4	ber of Alonta tes Injurier	for Fores	Manner of Corbson	CHEAT THE CHATCH THE CANTERNATION CHATCH THE CANTERNATION CHATCH THE CANTERNATION CHATCH THE CANTER THE CHATCH	t Vende Treval Directors	tractions Most Harmal Events	Vence Configuration	Poud Suffe.	Amberitiga	Weather Condition	Rad Sumos Rad Sumos Condistra Ambert Lipti Weather Carollian Al Resolve, Interestion	Paramone (mercanton than thombs thoughts) No recitor, the process of the paramone of the param	heay Matematical form	Delang for	Determent from Negress	National Type
2748451	WATERTOWN	06-30(-20)	11 4.20 PM	WATERTOWN 06-34-2011 4:20 PM Non-Islal Inlury	-			Shale vehicle cras.	Shale vehicle crash VI: Traveling straight ahead	d VI:Westbound	V1: Other non-collision V1: MOPED	V1: MOPED	ě	Davitcht	Cro	ARLINGTON ST / MT AUBURN ST					
2759236	WATERTOWN 04-Aug-2011 2,48 PM	04.Aug.20	D11 2.48 PM	Ptoperty damage only (none injured)	2	. 5	D	Angle	VI; Stowing or stopped in traffic / V2.Tsming left	VI.Eastbound /	VI: Collision with motor vehicle in Infinity VZ. Eastbound Infinity VZ Eastbound Infinity	V1: Truck/trailer / V2:Passenger car	È	Orvlph	Qest		MOUNT AUBURN STREET / ARLINGTON STREET RIN 16	, 10		MT AUBURN GRILL	
2758879	Property only (non- only (non- WATERTOWN 06-Sep-2011 10:30 PM injured)	06-5ep-20	NA 00:01 110	Property damage only (none injured)	2			Rear-end	VI: Slowing or stopped in Italific	affic d Vt.Eastbound / V2.Eastbo	(VI: Colsiston with motor vehicle in 10.6 / V.): Collision with motor vehicle in VI: Passenger car / 2.Eastbound traffic	VI: Passenger car I V2.Passenger car	Wel	Dark - Fohted roadway	Rain/Cloudy	MT AUBURN ST / ARLINGTON ST					

Page 1

☐ Trip Generation Calculations



Institute of Transportation Engineers (ITE) 9th Edition

Land Use Code (LUC) 880 - Pharmacy/Drugstore without Drive-Through Window

Average Vehicle Trips Ends vs:

1,000 Sq. Feet Gross Floor Area

Independent Variable (X):

Pass-By:

0.53

AVERAGE WEEKDAY DAILY	<u> </u>		Total	Pass-By	Net New
T = 90.06 * (X)		AM			
T = 90.06 * 14		In	27	11	16
T = 1260.84		Out	<u>14</u>	<u>11</u>	<u>3</u>
T = 1,260 vehicle trips		Total	41	22	19
with 50% (630 vpd) entering and 50% (630 vpd) exiting.					
		PM			
WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC	_	In	58	31	27
T = 2.94 * (X)	_	Out	<u>60</u>	<u>31</u>	<u>29</u>
T = 2.94 * 14.0		Total	118	62	56
T = 41.16					
T = 41 vehicle trips		Sat			
with 65% (27 vpd) entering and 35% (14 vpd) exiting.		In	74	40	34
		Out	<u>76</u>	<u>40</u>	<u>36</u>
		Total	150	80	70
WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC	_				
T = 8.40 * (X)	 Weekday	Daily	1,260	668	592
T = 8.40* 14.0	•	-			
T = 117.60	Saturday	Daily	1,603	850	753
T = 118 vehicle trips	•	•			
with 49% (58 vph) entering and 51% (60 vph) exiting.					

SATURDAY DAILY

(Weekday Daily/Weekday PM)*Saturday Midday

90.06 8.40

У 10.68 115

T=y*(X)

T= 1603

with 50% (802 vph) entering and 50% (

802 vph) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 10.68 * (X)T = 10.68 *

(Small Sample Size - Use with Caution)

T = 149.52

T = 150vehicle trips

with 49% (74 vph) entering and 51% (

76 vph) exiting.

Institute of Transportation Engineers (ITE) 9th Edition Land Use Code (LUC) 710 - General Office Building

Average Vehicle Trips Ends vs:

Employees

Independent Variable (X):

12

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AVERAGE WEEKDAY DAILY
```

 $\Gamma = 3.32 * (X)$

T = 3.32 * 12

T = 39.84

T = 40 vehicle trips

with 50% (20 vpd) entering and 50% (20 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.48 * (X)

T = 0.48 * 12

T = 5.76

T = 6 vehicle trips

with 88% (5 vph) entering and 12% (1 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.46 * (X)

T = 0.46 * 12

T = 5.52

T = 6 vehicle trips

with 17% (1 vph) entering and 83% (5 vph) exiting.

SATURDAY DAILY

T = 0.54 * (x)

T = 0.54 * 12

T = 6.48

T = 6 vehicle trips

with 50% (3 vpd) entering and 50% (3 vpd) exiting.

SATURDAY MIDDAY PEAK HOUR OF GENERATOR

T = 0.09 * (X)

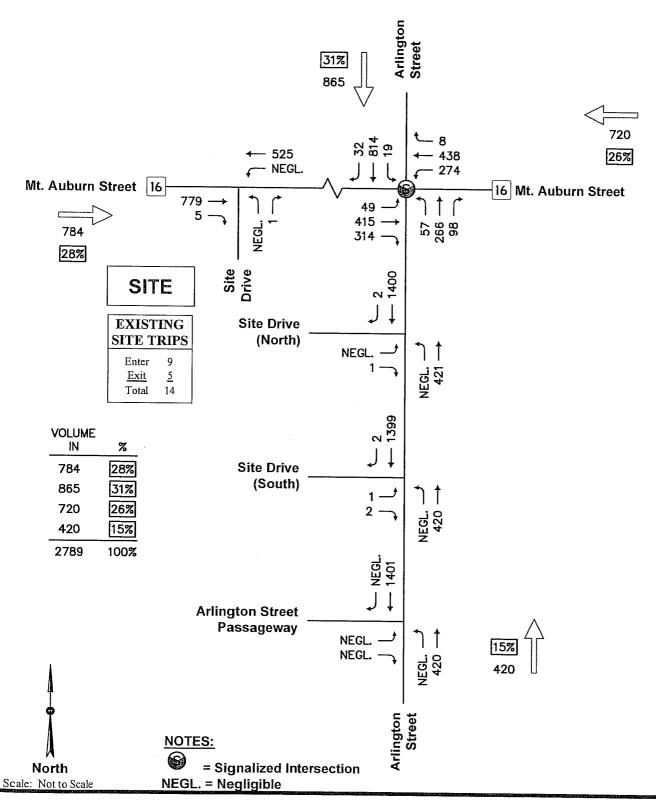
T = 0.09 * 12

T = 1.08

T = 1 vehicle trips

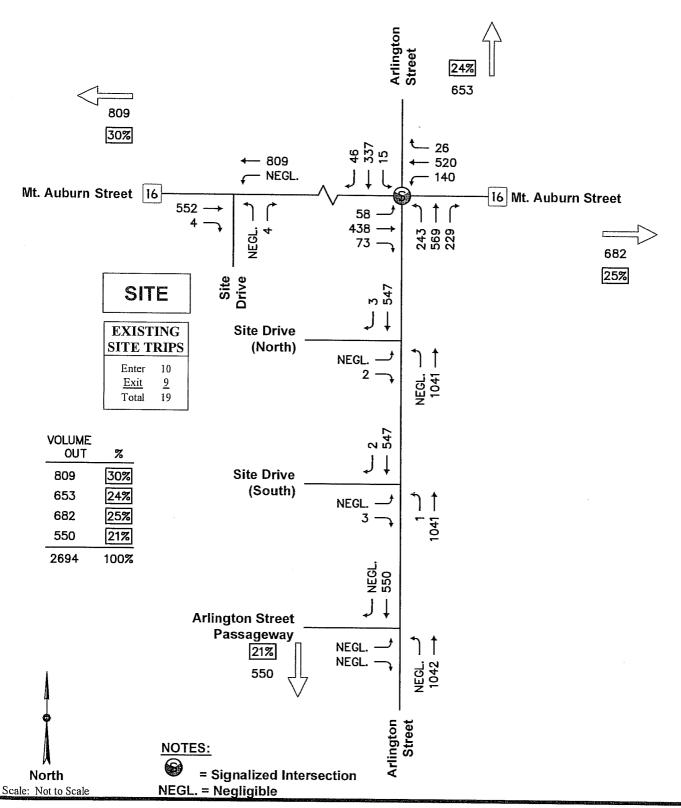
with 54% (1 vph) entering and 46% (0 vph) exiting.

□ Trip Distribution Calculations



Attachments

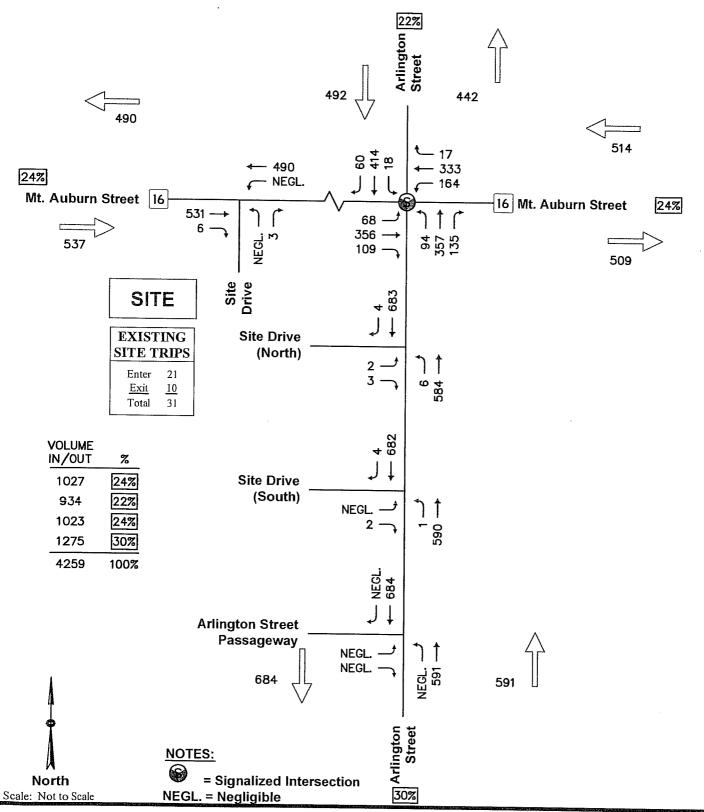
Trip Distribution Calculations - Step 1
Existing Travel Patterns - Weekday Morning Peak Hour
(Net New Trips)



Attachments

Trip Distribution Calculations - Step 2
Existing Travel Patterns - Weekday Evening Peak Hour
(Net New Trips)

Watertown, Massachusetts



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Attachments

Trip Distribution Calculations - Step 3
Existing Travel Patterns - Saturday Midday Peak Hour
(Net New Trips)

Trip Distribution Calculations (Net New Trips):

Average of Weekday Morning, Weekday Evening and Saturday Midday Peak Hours:

Route 16 (To/From West) = (28%+30%+24%)/3 = 27% SAY 25%

Arlington Street (To/From North) = (31%+24%+22%)/3 = 26% SAY 25%

Route 16 (To/From East) = (26%+25%+24%)/3 = 25% SAY 25%

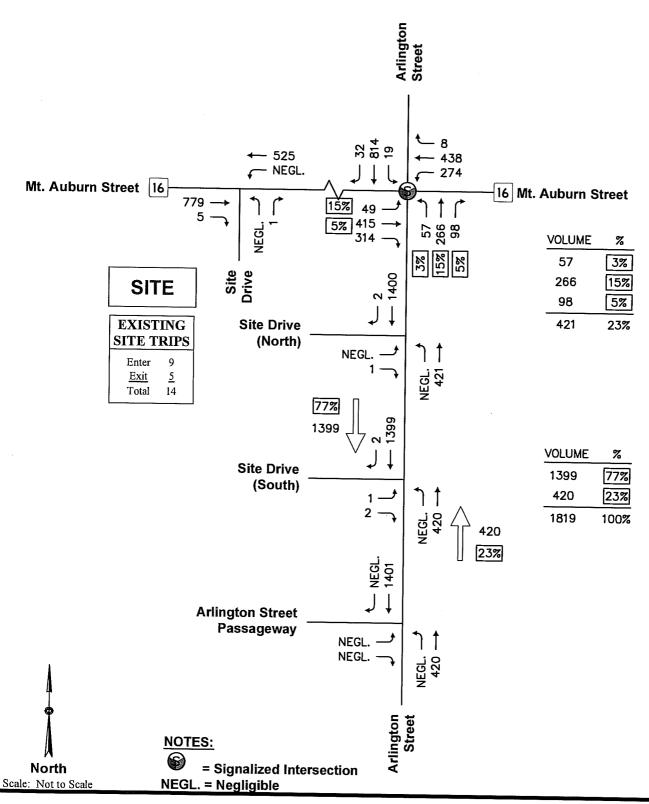
Arlington Street (To/From South) = (15%+21%+30%)/3 = 22% SAY 25%



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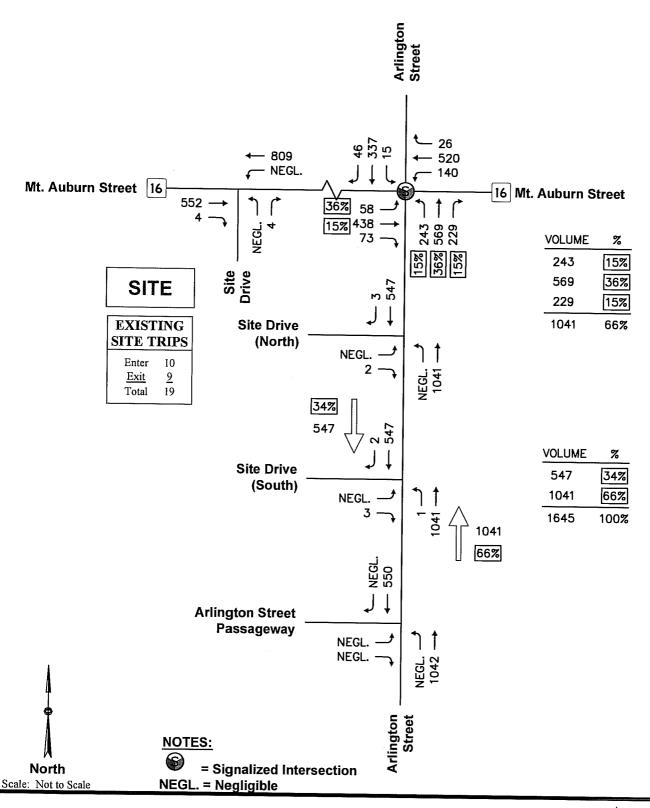
Attachments

Trip Distribution Calculations - Step 4
Existing Travel Patterns - Averages
(Net New Trips)



Attachments

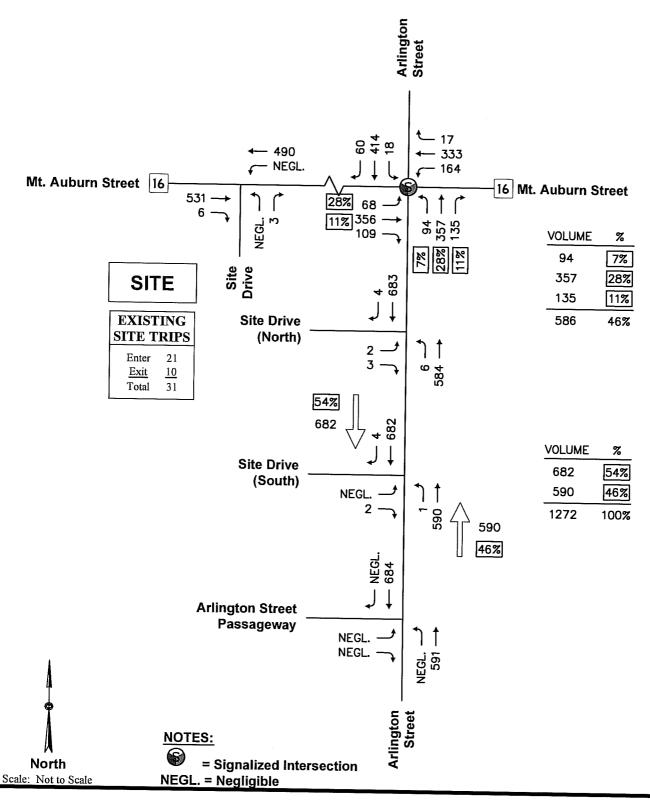
Trip Distribution Calculations - Step 1
Existing Travel Patterns - Weekday Morning Peak Hour
(Pass-By Trips)



Attachments

Trip Distribution Calculations - Step 2
Existing Travel Patterns - Weekday Evening Peak Hour
(Pass-By Trips)

Date: June 2014
Dwg No. 743 TIAS02.dwg
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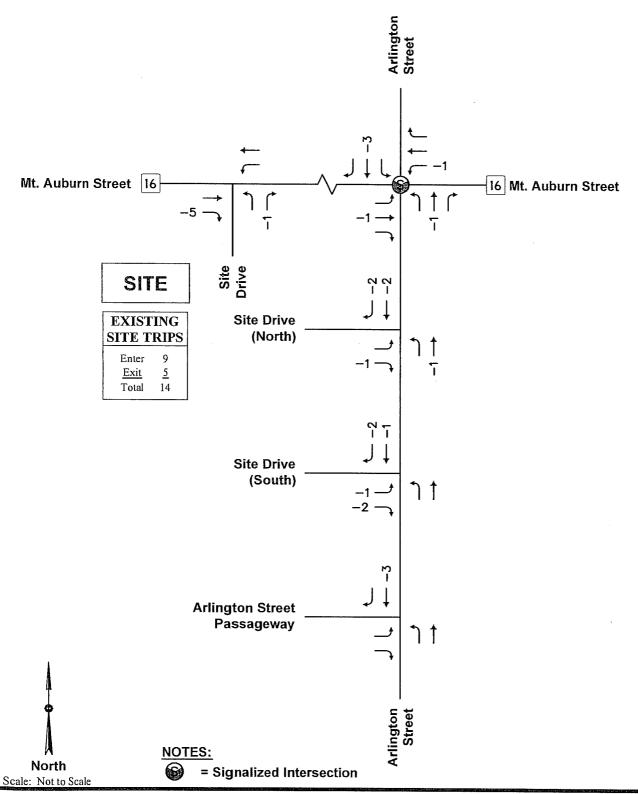
Attachments

Trip Distribution Calculations - Step 3 Existing Travel Patterns - Saturday Midday Peak Hour

(Pass-By Trips)

		•	

□ Existing Site Trip Tracings



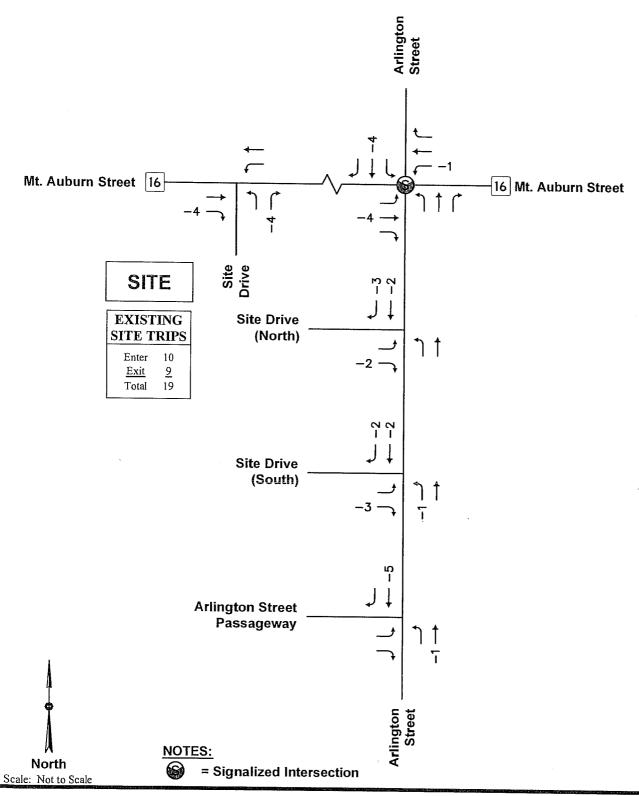


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Removal of Existing Site Trips Weekday Morning Peak Hour



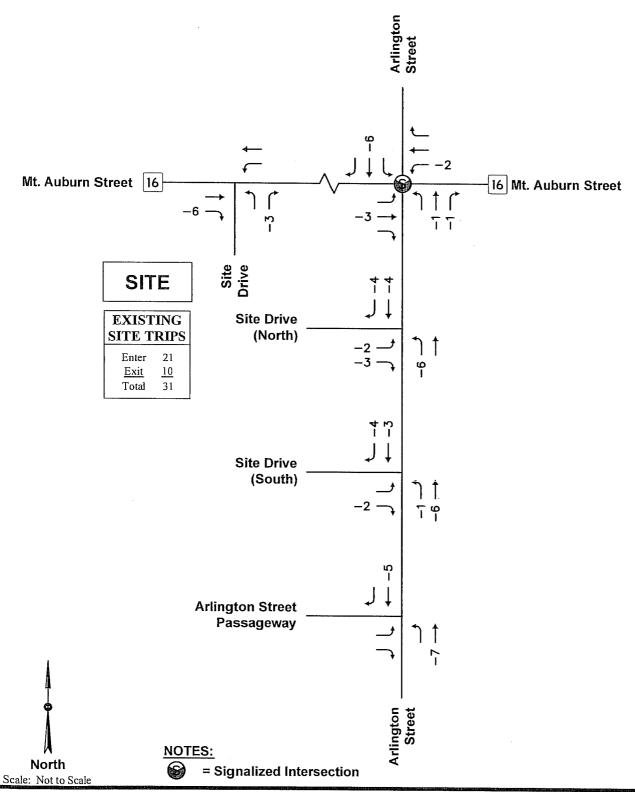
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Attachments

Removal of Existing Site Trips Weekday Evening Peak Hour



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Attachments

Removal of Existing Site Trips Saturday Midday Peak Hour

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Capacity Analysis Worksheets

LEVEL OF SERVICE METHODOLOGY

Capacity analysis of intersections is developed using the Synchro® computer software, which implements the methods of the 2010 Highway Capacity Manual (HCM). The resulting analysis presents a level-of-service (LOS) designation for individual intersection movements and (for signalized intersections) for the entire intersection. The LOS is a letter designation that provides a qualitative measure of operating conditions based on several factors including roadway geometry, speeds, ambient traffic volumes, traffic controls, and driver characteristics. Since the LOS of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of LOS, depending on the time of day, day of week, or period of year. A range of six levels of service are defined on the basis of average delay, ranging from LOS A (the least delay) to LOS F (delays greater than 50 seconds for unsignalized movements, and greater than 80 seconds for signalized movements).

Signalized Intersection Performance Measures

The six LOS designations for signalized intersections may be described as follows:

- LOS A describes operations with low control delay; most vehicles do not stop at all.
- LOS B describes operations with relatively low control delay. However, more vehicles stop than LOS A.
- LOS C describes operations with higher control delays. Individual cycle failures
 may begin to appear. The number of vehicles stopping is significant at this level,
 although many still pass through the intersection without stopping.
- LOS D describes operations with control delay in the range where the influence of congestion becomes more noticeable. Many vehicles stop and individual cycle failures are noticeable.
- LOS E describes operations with high control delay values. Individual cycle failures are frequent occurrences.
- LOS F describes operations with high control delay values that often occur with over-saturation. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

The LOS for signalized intersections are calculated using the operational analysis methodology of the 2010 *Highway Capacity Manual*.¹ This method assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on delay. LOS designations are based on the criterion of control or signal delay per vehicle. Control or signal delay is a measure of driver discomfort, frustration, and fuel consumption, and includes initial deceleration delay approaching the traffic signal, queue move-up time, stopped delay and final acceleration delay. **Table A1** summarizes the relationship between LOS and control delay. The tabulated control delay criterion may be applied in assigning LOS designations to individual lane groups, to individual intersection approaches, or to entire intersections.

Table A1 LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS¹

Control (Signal) Delay per Vehicle (Seconds)
<10.0
10.1 to 20.0
20.1 to 35.0
35.1 to 55.0
55.1 to 80.0
>80.0

¹Source: *Highway Capacity Manual 2010*; Transportation Research Board; Washington, DC; 2010.

¹Highway Capacity Manual 2010; Transportation Research Board; Washington, DC; 2010.

Unsignalized Intersection Performance Measures

The six LOS designations for unsignalized intersections may be described as follows:

- LOS A represents a condition with little or no control delay to minor street traffic.
- LOS B represents a condition with short control delays to minor street traffic.
- LOS C represents a condition with average control delays to minor street traffic.
- LOS D represents a condition with long control delays to minor street traffic.
- LOS E represents operating conditions at or near capacity level, with very long control delays to minor street traffic.
- LOS F represents a condition where minor street demand volume exceeds capacity of an approach lane, with extreme control delays resulting.

The LOS designations of unsignalized intersections are determined by application of a procedure described in the 2010 *Highway Capacity Manual*.² LOS is measured in terms of average control delay. Mathematically, control delay is a function of the capacity and degree of saturation of the lane group and/or approach under study and is a quantification of motorist delay associated with traffic control devices such as traffic signals and STOP signs. Control delay includes the effects of initial deceleration delay approaching a STOP sign, stopped delay, queue move-up time, and final acceleration delay from a stopped condition. Definitions for LOS at unsignalized intersections are also given in the *Highway Capacity Manual 2010*. **Table A2** summarizes the relationship between LOS and average control delay.

Table A2 LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS¹

	Level of Service						
Average Control Delay (seconds per vehicle)	v/c ≤ 1	v/c > 1					
≤ 10.0	A	F					
10.1 to 15.0	В	F					
15.1 to 25.0	С	F					
25.1 to 35.0	D	F					
35.1 to 50.0	E	F					
>50.0	F	F					

¹Source: *Highway Capacity Manual 2010*, Transportation Research Board; Washington, DC; 2010.

² ibid

	٠	>	*	•	+	4	4	†	<i>></i>	\	+	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	44		ሻ	† 1>			4 14	HEI	ODL	414	ODIN
Volume (vph)	49	415	314	274	438	8	57	266	98	19	814	32
ldeal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	- 11	12	12	12	12	12	12	11	11	11
Storage Length (ft)	75		0	200		0	0		0	0	' '	0
Storage Lanes	1		0	1		0	0		Ö	Ö		0
Taper Length (ft)	25			25			25			25		ŭ
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.935			0.997			0.965			0.995	0.00
Fit Protected	0.950			0.950				0.993			0.999	
Satd. Flow (prot)	1646	3177	0	1736	3496	0	0	3245	0	0	3351	0
Flt Permitted	0.492			0.153				0.595			0.938	
Satd. Flow (perm)	852	3177	0	280	3496	0	0	1944	0	0	3146	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			500			80	
Travel Time (s)	0.00	11.4			11.4			11.4			1.8	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	6%	4%	1%	4%	3%	0%	2%	6%	11%	5%	3%	16%
Adj. Flow (vph)	49	419	317	277	442	8	58	269	99	19	822	32
Shared Lane Traffic (%) Lane Group Flow (vph)	49	720	0	077	450	_	_					
Enter Blocked Intersection	H9 No	736	0	277	450	. 0	. 0	426	0	0	873	0
Lane Alignment	Left	No Left	No Bight	No	No	No	No	No	No	No	No	No
Median Width(ft)	Len	12	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Link Offset(ft)		0			12			0			0	
Crosswalk Width(ft)		16			0 16			0			0	
Two way Left Turn Lane		10			10			16			16	
Headway Factor	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	4.00	4.04	4.04	404
Turning Speed (mph)	15		9	15	1.00	9	1.00	1.00	1.00 9	1.04	1.04	1.04
Number of Detectors	1	2	Ü	1	2	J	13	2	9	15 1	0	9
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	2 Th	
Leading Detector (ft)	20	100		20	100		20	100		20	Thru 100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	Ö		Ö	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	CI+Ex		CI+Ex	Cl+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel								O. L.		OI · LX	OI. LX	
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94		0.0	94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			Cl+Ex	
Detector 2 Channel											-	
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		2		1	6		3	8			4	

Lane Group ø9 Lane Configurations Volume (vph) Ideal Flow (vphp!) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Fit Protected Satd. Flow (prot) Fit Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) Lane Group Flow (vph) Enter Blocked Intersection Lane Alignment Median Width(ft) Link Offset(ft) Crosswalk Width(ft) Two way Left Turn Lane Headway Factor Turning Speed (mph) Number of Detectors **Detector Template** Leading Detector (ft) Trailing Detector (ft) Detector 1 Position(ft) Detector 1 Size(ft) Detector 1 Type Detector 1 Channel Detector 1 Extend (s) Detector 1 Queue (s) Detector 1 Delay (s) Detector 2 Position(ft) Detector 2 Size(ft) Detector 2 Type **Detector 2 Channel** Detector 2 Extend (s) Turn Type

9

Protected Phases

	٦	→	•	•	—	4	*	†	<i>*</i>			2
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	, NBL	NBT	, NDD	CDI	♥	000
Permitted Phases	2		LBIT	6	VVD1	VVDIN		INDI	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		8 3	8		4		
Switch Phase	_	-		'	U		J	0		4	. 4	
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	6.0		C 0	0.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	12.0		6.0	6.0	
Total Split (s)	27.0	27.0		13.0	40.0		10.0	38.0		12.0	12.0	
Total Split (%)	26.2%	26.2%		12.6%	38.8%		9.7%	36.9%		28.0	28.0	
Maximum Green (s)	21.0	21.0		7.0	34.0		4.0	32.0		27.2% 22.0	27.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	22.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	0.0		2.0	2.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			0.0	
Lead/Lag	Lag	Lag		Lead	0.0		Lead	0.0		Log	6.0	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Lag Yes	Lag	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	Yes	
Recall Mode	C-Min	C-Min		None	C-Min		None	None			3.0 None	
Walk Time (s)					O IVIII		110110	None		None	None	
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	23.8	23.8		49.0	49.0			32.0			32.0	
Actuated g/C Ratio	0.23	0.23		0.48	0.48			0.31			0.31	
v/c Ratio	0.25	1.00		0.69	0.27			0.71			0.89	
Control Delay	36.9	74.4		37.0	19.5			38.9			46.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	36.9	74.4		37.0	19.5			38.9			46.9	
LOS	D	Е		D	В			D			40.9 D	
Approach Delay		72.0			26.2			38.9			46.9	
Approach LOS		Ε			С			D			70.9 D	
90th %ile Green (s)	21.0	21.0		7.0	34.0		0.0	32.0		32.0	32.0	
90th %ile Term Code	Coord	Coord		Max	Coord		Skip	Max		Max	Max	
70th %ile Green (s)	21.0	21.0		7.0	34.0		0.0	32.0		32.0	32.0	
70th %ile Term Code	Coord	Coord		Max	Coord		Skip	Max		Max	Max	
50th %ile Green (s)	30.4	30.4		22.6	59.0		0.0	32.0		32.0	32.0	
50th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Hold		Max	Max	
30th %ile Green (s)	25.8	25.8		27.2	59.0		0.0	32.0		32.0	32.0	
30th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Hold		Max	Max	
10th %ile Green (s)	21.0	21.0		32.0	59.0		0.0	32.0		32.0	32.0	
10th %ile Term Code	Coord	Coord		Max	Coord		Skip	Hold		Max	Max	
Queue Length 50th (ft)	24	233		87	71		•	129			286	
Queue Length 95th (ft)	63	#417		#365	163			188			#402	
Internal Link Dist (ft)		420			420			420			1	
Turn Bay Length (ft)	75			200							•	
Base Capacity (vph)	197	735		403	1663			603			977	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			. 0			0	
Storage Cap Reductn	0	0		0	0			. 0			0	
Reduced v/c Ratio	0.25	1.00		0.69	0.27			0.71			0.89	
Intersection Summary								 '			0.00	
	Other											
Area Type:	Other											

G:\Projects\743 - Watertown (Pharmacy)\Synchro\743 XAM.syn MDM Transportation Consultants, Inc.

Lane Group ø9 Permitted Phases Detector Phase Switch Phase Minimum Initial (s) 7.0 Minimum Split (s) 25.0 Total Split (s) 25.0 Total Split (%) 24% Maximum Green (s) 19.0 Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Detector Phase Switch Phase Minimum Initial (s) 7.0 Minimum Split (s) 25.0 Total Split (s) 25.0 Total Split (%) 24% Maximum Green (s) 19.0 Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Switch Phase Minimum Initial (s) 7.0 Minimum Split (s) 25.0 Total Split (s) 25.0 Total Split (%) 24% Maximum Green (s) 19.0 Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Minimum Initial (s) 7.0 Minimum Split (s) 25.0 Total Split (s) 25.0 Total Split (%) 24% Maximum Green (s) 19.0 Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Minimum Split (s) 25.0 Total Split (s) 25.0 Total Split (%) 24% Maximum Green (s) 19.0 Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Total Split (s) 25.0 Total Split (%) 24% Maximum Green (s) 19.0 Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Total Split (%) 24% Maximum Green (s) 19.0 Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Maximum Green (s) 19.0 Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Yellow Time (s) 4.0 All-Red Time (s) 2.0 Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
All-Red Time (s) Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Lost Time Adjust (s) Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Total Lost Time (s) Lead/Lag Lead-Lag Optimize?
Lead/Lag Lead-Lag Optimize?
Lead-Lag Optimize?
Vehicle Extension (s) 3.0
Recall Mode None
Walk Time (s) 7.0
Flash Dont Walk (s) 12.0
Pedestrian Calls (#/hr) 15
Act Effct Green (s)
Actuated g/C Ratio
//c Ratio
Control Delay
Queue Delay
Total Delay [*]
LOS
Approach Delay
Approach LOS
90th %ile Green (s) 19.0
90th %ile Term Code Ped
70th %ile Green (s) 19.0
70th %ile Term Code Ped
50th %ile Green (s) 0.0
50th %ile Term Code Skip
30th %ile Green (s) 0.0
80th %ile Term Code Skip
0th %ile Green (s) 0.0
Oth %ile Term Code Skip
Queue Length 50th (ft)
Queue Length 95th (ft)
nternal Link Dist (ft)
urn Bay Length (ft)
Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced v/c Ratio
ntersection Summary
itorocolori Guitania y

Lanes, Volumes, Timings 1: Arlington Street & Mount Auburn Street

Existing (Baseline)
Weekday Morning Peak Hour

Cycle Length: 103

Actuated Cycle Length: 103

Offset: 28 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00 Intersection Signal Delay: 47.3 Intersection Capacity Utilization 92.9%

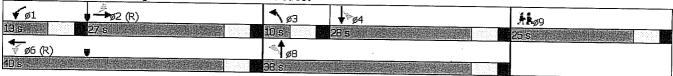
Intersection LOS: D
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Arlington Street & Mount Auburn Street



	vveekday Evening Fea							ak i loui				
	۶	-	•	•	←	•	•	†	/	/	ļ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	↑ }		ሻ	† }			414			4P	ODIX
Volume (vph)	58	438	73	140	520	26	243	569	229	15	337	46
ldeal Flow (vphpl)	1900	1900	1900	1900	1900	1900		1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12		12	12	11	11	11
Storage Length (ft)	75		0	200		0	0		0	0	• •	0
Storage Lanes	1		0	1		0	0		ő	0		0
Taper Length (ft)	25			25			25		Ÿ	25		U
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.979			0.993			0.967	0.00	0.00	0.983	0.33
FIt Protected	0.950			0.950				0.988			0.998	
Satd. Flow (prot)	1694	3340	0	1687	3518	0	0	3363	0	0	3331	0
FIt Permitted	0.441			0.297		-		0.713	Ū	·	0.785	U
Satd. Flow (perm)	786	3340	0	527	3518	0	0	2427	0	0	2620	0
Right Turn on Red			No			No			No	v	2020	No
Satd. Flow (RTOR)									110			140
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			500			80	
Travel Time (s)		11.4			11.4			11.4			1.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	2%	4%	7%	2%	0%	3%	1%	6%	0.57	3%	2%
Adj. Flow (vph)	60	452	75	144	536	27	251	587	236	15	347	47
Shared Lane Traffic (%)								,	200	10	047	41
Lane Group Flow (vph)	60	527	. 0	144	563	0	0	1074	0	0	409	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12	-		12	•		0		2010	0	ragin
Link Offset(ft)		0			0			Ö			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	Ū
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		Ō	Ö	
Detector 1 Size(ft)	20	6		20	6,		20	6		20	6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel											- ,,	
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel											- ^	
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		2		1	6		3	8			4	
							-	-			•	

Lane Group ø9 Lane Configurations Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Flt Protected Satd. Flow (prot) FIt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) Lane Group Flow (vph) Enter Blocked Intersection Lane Alignment Median Width(ft) Link Offset(ft) Crosswalk Width(ft) Two way Left Turn Lane Headway Factor Turning Speed (mph) Number of Detectors **Detector Template** Leading Detector (ft) Trailing Detector (ft) Detector 1 Position(ft) Detector 1 Size(ft) Detector 1 Type **Detector 1 Channel** Detector 1 Extend (s) Detector 1 Queue (s) Detector 1 Delay (s) Detector 2 Position(ft) Detector 2 Size(ft) Detector 2 Type **Detector 2 Channel** Detector 2 Extend (s) Turn Type Protected Phases 9

	٠	→	•	•	—	4	*	†	<i>*</i>	-	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	, NBR	CDI	▼	000
Permitted Phases	2			6	1101	YYDIX	8	INDI	INDIX	SBL	SBT	SBR
Detector Phase	2	2		1	6		3	8		4		
Switch Phase		_		•	U		J	0		4	4	
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	6.0		6.0	0.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	12.0		6.0	6.0	
Total Split (s)	28.0	28.0		13.0	41.0		10.0	37.0		12.0	12.0	
Total Split (%)	27.2%	27.2%		12.6%	39.8%		9.7%	35.9%		27.0	27.0	
Maximum Green (s)	22.0	22.0		7.0	35.0		4.0	31.0		26.2%	26.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		21.0 4.0	21.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0			4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	0.0		2.0	2.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			0.0	
Lead/Lag	Lag	Lag		Lead	0.0		Lead	0.0		1	6.0	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Lag	Lag	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		Yes	Yes	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		3.0	3.0	
Walk Time (s)		•		110110	Onville		INORIG	Mone		None	None	
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	36.2	36.2		51.1	51.1			24.0			04.0	
Actuated g/C Ratio	0.35	0.35		0.50	0.50			34.9			34.9	
v/c Ratio	0.22	0.45		0.40	0.32			0.34			0.34	
Control Delay	29.1	28.6		20.2	17.5			1.31			0.46	
Queue Delay	0.0	0.0		0.0	0.0			177.7			29.6	
Total Delay	29.1	28.6		20.2	17.5			0.0 177.7			0.0	
LOS	C	C		20.2 C	17.3 B			177.7 F			29.6	
Approach Delay	•	28.6		J	18.0			г 177.7			С	
Approach LOS		C			В			177.7 F			29.6	
90th %ile Green (s)	22.0	22.0		7.0	35.0		0.0	31.0		24.0	C	
90th %ile Term Code	Coord	Coord		Max	Coord		Skip	Max		31.0	31.0	
70th %ile Green (s)	42.1	42.1		11.0	59.1		0.0	31.9		Hold	Hold	
70th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		31.9	31.9	
50th %ile Green (s)	39.8	39.8		10.1	55.9		0.0	35.1		Hold	Hold	
50th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		35.1	35.1	
30th %ile Green (s)	39.3	39.3		9.0	54.3		0.0	36.7		Hold	Hold	
30th %ile Term Code	Coord	Coord		Gap	Coord		Skip			36.7	36.7	
10th %ile Green (s)	37.8	37.8		7.4	51.2		0.0	Max 39.8		Hold	Hold	
10th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		39.8	39.8	
Queue Length 50th (ft)	26	131		45	100		Skip	√478		Hold	Hold	
Queue Length 95th (ft)	75	232		118	203			~476 #643			109	
Internal Link Dist (ft)	. •	420		110	420			#643 420			165	
Turn Bay Length (ft)	75	120		200	720			420			1	
Base Capacity (vph)	276	1173		361	1745			999			007	
Starvation Cap Reductn	0	0		0	0			822			887	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.22	0.45		0.40	0.32			0 1.31			0 0.46	
Intersection Summary					_			,			0.40	
Area Type:	Other											
	- U 1 U 1											

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Lane Group	ø9			
Permitted Phases	90		 	
Detector Phase				
Switch Phase				
	7.0			
Minimum Initial (s)	7.0			
Minimum Split (s)	25.0			
Total Split (s)	25.0			
Total Split (%)	24%			
Maximum Green (s)	19.0			
Yellow Time (s)	4.0			
All-Red Time (s)	2.0			
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?	0.0			
Vehicle Extension (s)	3.0			
Recall Mode	None			
Walk Time (s)	7.0			
Flash Dont Walk (s)	12.0			
Pedestrian Calls (#/hr)	11			
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach LOS				
Approach LOS	40.0			
90th %ile Green (s)	19.0			
90th %ile Term Code	Ped			
70th %ile Green (s)	0.0			
70th %ile Term Code	Skip			
50th %ile Green (s)	0.0	*		
50th %ile Term Code	Skip			
30th %ile Green (s)	0.0			
30th %ile Term Code	Skip			
10th %ile Green (s) 10th %ile Term Code	0.0			
	Skip			
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductn				
Reduced v/c Ratio				
Intersection Summary				

Lanes, Volumes, Timings 1: Arlington Street & Mount Auburn Street

Existing (Baseline)
Weekday Evening Peak Hour

Cycle Length: 103

Actuated Cycle Length: 103

Offset: 28 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.31 Intersection Signal Delay: 83.7 Intersection Capacity Utilization 83.5%

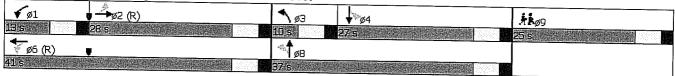
Intersection LOS: F
ICU Level of Service E

Analysis Period (min) 15

Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Splits and Phases: 1: Arlington Street & Mount Auburn Street



									Catarday Miladay Feak Flour			
	<i>▶</i>	\rightarrow	•	•	•	*	1	†	1	/	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	↑ Ъ		Ť	∱ }			413			4 î >	<u> </u>
Volume (vph)	68	356	109	164	333	17	94	357	135	18	414	60
ldeal Flow (vphpi)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	11	11	11
Storage Length (ft)	75		0	200		0	0		0	0	• • • • • • • • • • • • • • • • • • • •	0
Storage Lanes	1		0	1		0	0		0	Ö		0
Taper Length (ft)	25			25			25		Ū	25		Ū
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.965			0.993			0.965		0.00	0.982	0.00
Flt Protected	0.950			0.950				0.992			0.998	
Satd. Flow (prot)	1694	3317	0	1770	3518	0	0	3414	0	0	3391	0
Flt Permitted	0.536			0.322				0.693		•	0.916	ŭ
Satd. Flow (perm)	956	3317	0	600	3518	0	0	2385	0	0	3113	0
Right Turn on Red			No			No			No		0110	No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			500			80	
Travel Time (s)		11.4			11.4			11.4			1.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%	1%	1%	2%	0%	1%	0%
Adj. Flow (vph)	70	367	112	169	343	18	97	368	139	19	427	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	479	0	169	361	0	0	604	0	0	508	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	•
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15	_	9	15		9	15		9	15		9
Number of Detectors	1	_ 2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft) Detector 1 Type	20	6		20	6		20	6		20	6	
Detector 1 Channel	Cl+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		Cl+Ex	Cl+Ex	
	0.0	0.0		0.0	0.0							
Detector 1 Extend (s) Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
, ,	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s) Detector 2 Position(ft)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Size(ft)		94			94			94			94	
• •		6 CUE ₂			6			6			6	
Detector 2 Type Detector 2 Channel		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Extend (s)		0.0			0.0			2 -			_	
Turn Type	Dorm	0.0		man 1 1	0.0			0.0		_	0.0	
Protected Phases	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
1 10100160 1 110363		2		1	6		3	8			4	

Lane Group Lane Configurations Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Flt Protected Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) Lane Group Flow (vph) Enter Blocked Intersection Lane Alignment Median Width(ft) Link Offset(ft) Crosswalk Width(ft) Two way Left Turn Lane Headway Factor Turning Speed (mph) Number of Detectors **Detector Template** Leading Detector (ft) Trailing Detector (ft) Detector 1 Position(ft) Detector 1 Size(ft) Detector 1 Type **Detector 1 Channel** Detector 1 Extend (s) Detector 1 Queue (s) Detector 1 Delay (s) Detector 2 Position(ft) Detector 2 Size(ft) Detector 2 Type

Turn Type Protected Phases

Detector 2 Channel Detector 2 Extend (s)

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Lane Group	EBL	EBT	EBR	▼ WBL	WBT	WBR	NBL	I NBT	•	CDI.	♦	₹
Permitted Phases	2		LDIN	6	VVDI	VVDIC		NDI	NBR	SBL	SBT	SBR
Detector Phase	2	2		1	6		3	8		4	4	
Switch Phase	_	_			U		3	0		4	4	
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	6.0			0.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	12.0		6.0	6.0	
Total Split (s)	25.0	25.0		13.0	38.0		10.0	40.0		12.0 30.0	12.0	
Total Split (%)	24.3%	24.3%		12.6%	36.9%		9.7%	38.8%		29.1%	30.0	
Maximum Green (s)	19.0	19.0		7.0	32.0		4.0	34.0			29.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		24.0 4.0	24.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0			4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	0.0		2.0	2.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			0.0	
Lead/Lag	Lag	Lag		Lead	0.0		Lead	0.0		1	6.0	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Lag	Lag	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		Yes	Yes	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		3.0	3.0	
Walk Time (s)	• 171111	O Willi		None	O-IVIII I		MOHE	None		None	None	
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	33.9	33.9		48.5	48.5			32.5			20.5	
Actuated g/C Ratio	0.33	0.33		0.47	0.47						32.5	
v/c Ratio	0.22	0.44		0.44	0.47			0.32			0.32	
Control Delay	34.1	32.3		25.5	19.9			0.80 41.3			0.52	
Queue Delay	0.0	0.0		0.0	0.0			0.0			30.7	
Total Delay	34.1	32.3		25.5	19.9			41.3			0.0	
LOS	C	C		20.0 C	В			41.3 D			30.7	
Approach Delay	ŭ	32.5		U	21.7			ط 41.3			C	
Approach LOS		C			C C			41.3 D			30.7	
90th %ile Green (s)	19.0	19.0		7.0	32.0		0.0	34.0		34.0	C	
90th %ile Term Code	Coord	Coord		Max	Coord		Skip	Max			34.0	
70th %ile Green (s)	19.0	19.0		7.0	32.0		0.0	34.0		Hold	Hold	
70th %ile Term Code	Coord	Coord		Max	Coord		Skip	Max		34.0	34.0	
50th %ile Green (s)	38.5	38.5		11.3	55.8		0.0	35.2		Hold	Hold	
50th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		35.2	35.2	
30th %ile Green (s)	42.7	42.7		9.8	58.5		0.0	32.5		Hold	Hold	
30th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Gap		32.5	32.5	
10th %ile Green (s)	50.3	50.3		7.9	64.2		0.0	26.8		Hold	Hold	
10th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Gap		26.8 Hold	26.8	
Queue Length 50th (ft)	31	119		54	60		Окір	182		HOIG	Hold 137	
Queue Length 95th (ft)	86	#223		#142	135			256				
Internal Link Dist (ft)		420		" 1 12	420			420			190	
Turn Bay Length (ft)	75			200	120			420			1	
Base Capacity (vph)	314	1091		380	1656			793			000	
Starvation Cap Reductn	0	0		0	0						982	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	Ö	0		0	0			0 0			0	
Reduced v/c Ratio	0.22	0.44		0.44	0.22			0.76			0 0.52	
Intersection Summary				•				0.70			0.02	
Area Type:	Other											
ruca rype.	Outel											

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Lane Group	ø9		
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0		
Minimum Split (s)	25.0		
Total Split (s)	25.0		
Total Split (%)	24%		
Maximum Green (s) Yellow Time (s)	19.0		
	4.0		
All-Red Time (s) Lost Time Adjust (s)	2.0		
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	2.0		
Recall Mode	3.0		
Walk Time (s)	None		
Flash Dont Walk (s)	7.0 12.0		
Pedestrian Calls (#/hr)	17.0		
Act Effct Green (s)	17		
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
90th %ile Green (s)	19.0		
90th %ile Term Code	Ped		
70th %ile Green (s)	19.0		
70th %ile Term Code	Ped		
50th %ile Green (s)	0.0		
50th %ile Term Code	Skip		
30th %ile Green (s)	0.0		
30th %ile Term Code	Skip		
10th %ile Green (s)	0.0		
10th %ile Term Code	Skip		
Queue Length 50th (ft)	- : [-		
Queue Length 95th (ft)			
Internal Link Dist (ft)			
Turn Bay Length (ft)			
Base Capacity (vph)			
Starvation Cap Reductn			
Spillback Cap Reductn			
Storage Cap Reductn			
Reduced v/c Ratio			
Intersection Summary			
Summary			

Lanes, Volumes, Timings 1: Arlington Street & Mount Auburn Street

Existing (Baseline) Saturday Midday Peak Hour

Cycle Length: 103

Actuated Cycle Length: 103

Offset: 28 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

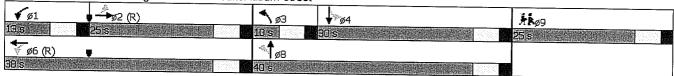
Maximum v/c Ratio: 0.80 Intersection Signal Delay: 31.9 Intersection Capacity Utilization 73.2%

Intersection LOS: C
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



	•	→	•	€	←	•	4	†	<i>></i>	\	ļ	-√
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	† }		J.	↑ Ъ			€ 1₽			र्सी	•
Volume (vph)	51	416	318	277	438	8	56	264	97	19	815	32
ldeal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	. 12	12	12	11	11	11
Storage Length (ft)	75		0	200		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.935			0.997			0.965			0.995	
Flt Protected	0.950			0.950				0.993			0.999	
Satd. Flow (prot)	1646	3177	0	1736	3496	0	0	3244	0	0	3351	0
Flt Permitted	0.492			0.153				0.598			0.938	
Satd. Flow (perm)	852	3177	0	280	3496	0	0	1954	0	0	3146	0
Right Turn on Red			No			No			. No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			500			80	
Travel Time (s)		11.4			11.4			11.4			1.8	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	6%	4%	1%	4%	3%	0%	2%	6%	11%	5%	3%	16%
Adj. Flow (vph)	52	420	321	280	442	8	57	267	98	19	823	32
Shared Lane Traffic (%)			_									
Lane Group Flow (vph)	52	741	0	280	450	0	0	422	0	0	874	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane	4.04	4.04	4.04	4.00	4.00	4.00	4.00	4.00	4.00	4.04	4.04	4.04
Headway Factor	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15	0	9	15	0	9	15	0	9	15	•	9
Number of Detectors	1	2 That		1	2 Than		1	2		1	2	
Detector Template	Left 20	Thru 100		Left 20	Thru 100		Left	Thru		Left	Thru	
Leading Detector (ft) Trailing Detector (ft)	0	0					20	100		20	100	
Detector 1 Position(ft)	0	0		0 0	0 0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		0 20	0 6		0	0	
Detector 1 Type	Cl+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		20 Cl+Ex	6 CUEv	
Detector 1 Channel	CITEX	CITEX		CITEX	CITEX		CITEX	CITEX		CI+EX	CI+Ex	
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0		
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)	0.0	94		0.0	94		0.0	94		0.0	0.0 94	
Detector 2 Size(ft)		6			6			6			9 4 6	
Detector 2 Type		CI+Ex			Cl+Ex			Cl+Ex			Ci+Ex	
Detector 2 Channel		OI. LX			OI · LA			OFEX			OLITEX	
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	, 91111	2		1	6		3	8		1 01111	4	
3.00,00 1 110,000		_		'	J		J	U			7	

Lane Group ø9 Lane Configurations Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Flt Protected Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) Lane Group Flow (vph) Enter Blocked Intersection Lane Alignment Median Width(ft) Link Offset(ft) Crosswalk Width(ft) Two way Left Turn Lane Headway Factor Turning Speed (mph) Number of Detectors **Detector Template** Leading Detector (ft) Trailing Detector (ft) Detector 1 Position(ft) Detector 1 Size(ft) Detector 1 Type **Detector 1 Channel** Detector 1 Extend (s) Detector 1 Queue (s) Detector 1 Delay (s) Detector 2 Position(ft) Detector 2 Size(ft) Detector 2 Type **Detector 2 Channel** Detector 2 Extend (s) Turn Type Protected Phases 9

	٠	-	*	•	←	*	4	†	1	>	ļ	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		4	4	
Switch Phase							_	ŭ				
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	12.0		12.0	12.0	
Total Split (s)	27.0	27.0		13.0	40.0		10.0	38.0		28.0	28.0	
Total Split (%)	26.2%	26.2%		12.6%	38.8%		9.7%	36.9%		27.2%	27.2%	
Maximum Green (s)	21.0	21.0		7.0	34.0		4.0	32.0		22.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		2.0	0.0		2.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lag	Lag		Lead	0.0		Lead	0.0		Lag		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Lag Yes	Lag Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None				
Walk Time (s)	0 141111	O WIIII		INOTIC	O-IVIIII		NOHE	None		None	None	
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	23.7	23.7		49.0	49.0			32.0			20.0	
Actuated g/C Ratio	0.23	0.23		0.48	0.48						32.0	
v/c Ratio	0.23	1.02		0.40	0.46			0.31			0.31	
Control Delay	37.4	77.4		37.2	19.5			0.70			0.89	
Queue Delay	0.0	0.0		0.0	0.0			38.4			47.0	
Total Delay	37.4	77.4		37.2	19.5			0.0			0.0	
LOS	57.4 D	77. 4 E		37.2 D	19.5 B			38.4			47.0	
Approach Delay	U	74.7		D	26.3			D			D	
Approach LOS		14.1 E			20.3 C			38.4			47.0	
90th %ile Green (s)	21.0	21.0		7.0	34.0		0.0	D		00.0	D	
90th %ile Term Code	Coord	Coord					0.0	32.0		32.0	32.0	
70th %ile Green (s)	21.0	21.0		Max	Coord		Skip	Max		Max	Max	
70th %ile Green (s) 70th %ile Term Code				7.0	34.0		0.0	32.0		32.0	32.0	
50th %ile Green (s)	Coord 30.1	Coord		Max	Coord		Skip	Max		Max	Max	
50th %ile Term Code		30.1		22.9	59.0		0.0	32.0		32.0	32.0	
30th %ile Green (s)	Coord	Coord		Gap	Coord		Skip	Hold		Max	Max	
30th %ile Term Code	25.4	25.4		27.6	59.0		0.0	32.0		32.0	32.0	
10th %ile Green (s)	Coord	Coord		Gap	Coord		Skip	Hold		Max	Max	
· , ,	21.0	21.0		32.0	59.0		0.0	32.0		32.0	32.0	
10th %ile Term Code	Coord	Coord		Max	Coord		Skip	Hold		Max	Max	
Queue Length 50th (ft)	26	236		88	71			127			287	
Queue Length 95th (ft)	67	#420		#370	163			186			#403	
Internal Link Dist (ft)	- -	420			420			420			1	
Turn Bay Length (ft)	75 405	700		200	4000							
Base Capacity (vph)	195	730		406	1663			607			977	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.27	1.02		0.69	0.27			0.70			0.89	
Intersection Summary												
Area Type:	Other		*******									

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Lane Group	~0			
Permitted Phases	ø9			
Detector Phase				
Switch Phase				
Minimum Initial (s)	7.0			
• •	7.0			
Minimum Split (s)	25.0			
Total Split (%)	25.0			
Total Split (%)	24%			
Maximum Green (s)	19.0			
Yellow Time (s)	4.0			
All-Red Time (s)	2.0			
Lost Time Adjust (s)				4
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?	2.0			
Vehicle Extension (s) Recall Mode	3.0			
	None			
Walk Time (s)	7.0			
Flash Dont Walk (s)	12.0			
Pedestrian Calls (#/hr)	15			
Act Effet Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	19.0			
90th %ile Term Code	Ped			
70th %ile Green (s)	19.0			
70th %ile Term Code	Ped			
50th %ile Green (s)	0.0			
50th %ile Term Code	Skip			
30th %ile Green (s)	0.0			
30th %ile Term Code	Skip			
10th %ile Green (s)	0.0			
10th %ile Term Code	Skip			
Queue Length 50th (ft)	Okip			
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Intersection Summary				
Storage Cap Reductn Reduced v/c Ratio Intersection Summary				

Cycle Length: 103

Actuated Cycle Length: 103

Offset: 28 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 140

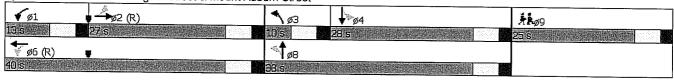
Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.02 Intersection Signal Delay: 48.1 Intersection Capacity Utilization 93.2%

Intersection LOS: D
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.



					Weekday Evening Feak Hour							
	•	>	*	€	←	*	•	†	1	-	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	4 %		ሻ	† }			414			414	ODIT
Volume (vph)	77	445	79	146	520	26	238	558	225	15	340	46
ldeal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12		12	12	11	11	1300
Storage Length (ft)	75		0	200		0	0	14	0	0	11	0
Storage Lanes	1		0	1		0	Ō		0	0		0
Taper Length (ft)	25			25		·	25		Ü	25		U
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.977			0.993		0,00	0.967	0.00	0.00	0.983	0.55
Flt Protected	0.950			0.950				0.988			0.998	
Satd. Flow (prot)	1694	3333	0	1687	3518	0	0	3363	0	0	3331	0
Flt Permitted	0.441			0.289			·	0.710	Ū	U	0.792	U
Satd. Flow (perm)	786	3333	0	513	3518	0	0	2416	0	0	2643	0
Right Turn on Red			No			No	·	2.10	No	U	2040	No
Satd. Flow (RTOR)									110			INO
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			500			80	
Travel Time (s)		11.4			11.4			11.4			1.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	2%	4%	7%	2%	0%	3%	1%	6%	0.57	3%	2%
Adj. Flow (vph)	79	459	81	151	536	27	245	575	232	15	351	276 47
Shared Lane Traffic (%)							2.0	0,0	202	13	301	41
Lane Group Flow (vph)	79	540	0	151	563	0	0	1052	0	0	413	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12	_		12			0	, agair	Lon	0	ragiit
Link Offset(ft)		0			0			Ō			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											10	
Headway Factor	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		. 9	15	1.01	9
Number of Detectors	1	2		1	2		1	2	•	1	2	J
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	Ö	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	CI+Ex		Cl+Ex	Cl+Ex		CI+Ex	Cl+Ex		Cl+Ex	CI+Ex	
Detector 1 Channel											J	
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94		0.0	94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel											o. ∟∧	
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		2		·	6		3	8		. 41111	4	
							=	•			7	

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Lane Group ø9 Lane Configurations Volume (vph) Ideal Flow (vphpl) Lane Width (ft) Storage Length (ft) Storage Lanes Taper Length (ft) Lane Util. Factor Frt Flt Protected Satd. Flow (prot) Flt Permitted Satd. Flow (perm) Right Turn on Red Satd. Flow (RTOR) Link Speed (mph) Link Distance (ft) Travel Time (s) Peak Hour Factor Heavy Vehicles (%) Adj. Flow (vph) Shared Lane Traffic (%) Lane Group Flow (vph) Enter Blocked Intersection Lane Alignment Median Width(ft) Link Offset(ft) Crosswalk Width(ft) Two way Left Turn Lane Headway Factor Turning Speed (mph) Number of Detectors **Detector Template** Leading Detector (ft) Trailing Detector (ft) Detector 1 Position(ft) Detector 1 Size(ft) Detector 1 Type Detector 1 Channel Detector 1 Extend (s) Detector 1 Queue (s) Detector 1 Delay (s) Detector 2 Position(ft) Detector 2 Size(ft) Detector 2 Type **Detector 2 Channel** Detector 2 Extend (s) Turn Type

9

Protected Phases

	٠	→	•	€	←	*	4	†	~	>	↓	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		4	4	
Switch Phase											·	
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	12.0		12.0	12.0	
Total Split (s)	28.0	28.0		13.0	41.0		10.0	37.0		27.0	27.0	
Total Split (%)	27.2%	27.2%		12.6%	39.8%		9.7%	35.9%		26.2%	26.2%	
Maximum Green (s)	22.0	22.0		7.0	35.0		4.0	31.0		21.0	21.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lag	Lag		Lead			Lead	-1-		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	36.2	36.2		51.4	51.4			34.6			34.6	
Actuated g/C Ratio	0.35	0.35		0.50	0.50			0.34			0.34	
v/c Ratio	0.29	0.46		0.42	0.32			1.30			0.47	
Control Delay	30.3	28.8		20.6	17.3			174.4			29.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	30.3	28.8		20.6	17.3			174.4			29.9	
LOS	С	С		С	В			F			С	
Approach Delay		29.0			18.0			174.4			29.9	
Approach LOS		С			В			F			С	
90th %ile Green (s)	22.0	22.0		7.0	35.0		0.0	31.0		31.0	31.0	
90th %ile Term Code	Coord	Coord		Max	Coord		Skip	Max		Hold	Hold	
70th %ile Green (s)	42.2	42.2		11.4	59.6		0.0	31.4		31.4	31.4	
70th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		Hold	Hold	
50th %ile Green (s)	39.9	39.9		10.5	56.4		0.0	34.6		34.6	34.6	
50th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		Hold	Hold	
30th %ile Green (s)	39.3	39.3		9.4	54.7		0.0	36.3		36.3	36.3	
30th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		Hold	Hold	
10th %ile Green (s)	37.7	37.7		7.8	51.5		0.0	39.5		39.5	39.5	
10th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		Hold	Hold	
Queue Length 50th (ft)	35	134		47	99			~467			111	
Queue Length 95th (ft)	96	237		123	203			#627			167	
Internal Link Dist (ft)		420			420			420			1	
Turn Bay Length (ft)	75	:		200								
Base Capacity (vph)	276	1171		361	1757			810			886	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.29	0.46		0.42	0.32			1.30			0.47	
Intersection Summary		•										
Area Type:	Other											

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Lano Croup	~0			
Lane Group Permitted Phases	ø9	 	 	
Detector Phase				
Switch Phase				
Minimum Initial (s)	7.0			
Minimum Split (s)	25.0			
Total Split (s)	25.0			
Total Split (%)	24%	•		
Maximum Green (s)	19.0			
Yellow Time (s)	4.0			
All-Red Time (s)	2.0			
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0			
Recall Mode	None			
Walk Time (s)	7.0			
Flash Dont Walk (s)	12.0			
Pedestrian Calls (#/hr)	11			
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	19.0			
90th %ile Term Code	Ped			
70th %ile Green (s)	0.0			
70th %ile Term Code	Skip			
50th %ile Green (s)	0.0			
50th %ile Term Code	Skip			
30th %ile Green (s)	0.0			
30th %ile Term Code	Skip			
10th %ile Green (s)	0.0			
10th %ile Term Code	Skip			
Queue Length 50th (ft)	Onip			
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn				
Storage Cap Reductin				
Reduced v/c Ratio				
Intersection Summary				

Cycle Length: 103

Actuated Cycle Length: 103

Offset: 28 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.30 Intersection Signal Delay: 81.0 Intersection Capacity Utilization 83.7%

Intersection LOS: F
ICU Level of Service E

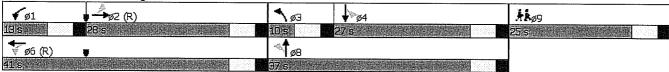
Analysis Period (min) 15

Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ሻ	∱ ⊅		*1	↑ }			4T)			414	
Volume (vph)	88	367	117	171	333	17	91	345	129	18	417	60
ldeal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	11	11	11
Storage Length (ft)	75		0	200		0	0		0	0		0
Storage Lanes	- 1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Frt		0.964			0.993			0.966			0.982	
Flt Protected	0.950			0.950				0.992			0.998	
Satd. Flow (prot)	1694	3314	0	1770	3518	0	0	3417	0	0	3391	0
Flt Permitted	0.536			0.310				0.689			0.918	
Satd. Flow (perm)	956	3314	0	577	3518	0	0	2374	0	0	3120	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		500			500			500			80	
Travel Time (s)		11.4			11.4			11.4			1.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	2%	0%	2%	2%	0%	1%	1%	2%	0%	1%	0%
Adj. Flow (vph)	91	378	121	176	343	18	94	356	133	19	430	62
Shared Lane Traffic (%)												•-
Lane Group Flow (vph)	91	499	0	176	361	0	0	583	0	0	511	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12	Ū		12	J		0	5		0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94		0.0	94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			Cl+Ex			CI+Ex			Cl+Ex	
Detector 2 Channel		- · - · ·			-			J^			♥ 1 · L ∧	
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases	. 5////	2		1 1	6		3	8		· Onn	4	
		_		'	U		J	U			4	

Lane Group	ø9
Lane Configurations	
Volume (vph)	
ldeal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
FIt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph) Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	^

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Protected Phases

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		1	6		3	8		4	4	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		4.0	6.0		6.0	6.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		10.0	12.0		12.0	12.0	
Total Split (s)	25.0	25.0		13.0	38.0		10.0	40.0		30.0	30.0	
Total Split (%)	24.3%	24.3%		12.6%	36.9%		9.7%	38.8%		29.1%	29.1%	`
Maximum Green (s)	19.0	19.0		7.0	32.0		4.0	34.0		24.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lead/Lag	Lag	Lag		Lead			Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	34.1	34.1		49.2	49.2			31.8			31.8	
Actuated g/C Ratio	0.33	0.33		0.48	0.48			0.31			0.31	
v/c Ratio	0.29	0.45		0.46	0.22			0.80			0.53	
Control Delay	35.0	32.5		26.1	19.6			41.3			31.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	35.0	32.5		26.1	19.6			41.3			31.3	
LOS	С	С		С	В			D			С	
Approach Delay		32.9			21.7			41.3			31.3	
Approach LOS		С			С			D			С	
90th %ile Green (s)	19.0	19.0		7.0	32.0		0.0	34.0		34.0	34.0	
90th %ile Term Code	Coord	Coord		Max	Coord		Skip	Max		Hold	Hold	
70th %ile Green (s)	19.0	19.0		7.0	32.0		0.0	34.0		34.0	34.0	
70th %ile Term Code	Coord	Coord		Max	Coord		Skip	Max		Hold	Hold	
50th %ile Green (s)	38.7	38.7		12.1	56.8		0.0	34.2		34.2	34.2	
50th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Max		Hold	Hold	
30th %ile Green (s)	43.0	43.0		10.6	59.6		0.0	31.4		31.4	31.4	
30th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Gap		Hold	Hold	
10th %ile Green (s)	50.8	50.8		8.6	65.4		0.0	25.6		25.6	25.6	
10th %ile Term Code	Coord	Coord		Gap	Coord		Skip	Gap		Hold	Hold	
Queue Length 50th (ft)	41	125		55	58			177			140	
Queue Length 95th (ft)	109	#244		#158	135			245			192	
Internal Link Dist (ft)		420			420			420			1	
Turn Bay Length (ft)	75			200								
Base Capacity (vph)	316	1097		380	1678			784			964	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.29	0.45		0.46	0.22			0.74			0.53	
Intersection Summary												
Агеа Туре:	Other		<u> </u>									

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Lane Group	ø9			
Permitted Phases				
Detector Phase				
Switch Phase				
	7.0			
Minimum Initial (s)	7.0			
Minimum Split (s)	25.0			
Total Split (s)	25.0			
Total Split (%)	24%			
Maximum Green (s)	19.0			
Yellow Time (s)	4.0			
All-Red Time (s)	2.0		•	
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0			
Recall Mode	None			
Walk Time (s)	7.0			
Flash Dont Walk (s)	12.0			
Pedestrian Calls (#/hr)	17			
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				
90th %ile Green (s)	19.0			
90th %ile Term Code	Ped			
70th %ile Green (s)	19.0			
70th %ile Term Code	Ped			
50th %ile Green (s)	0.0			
50th %ile Term Code	Skip			
30th %ile Green (s)	0.0			
30th %ile Term Code	Skip			
10th %ile Green (s)	0.0			
10th %ile Term Code	Skip			
Queue Length 50th (ft)				
Queue Length 95th (ft)				
Internal Link Dist (ft)				
Turn Bay Length (ft)				
Base Capacity (vph)				
Starvation Cap Reductn				
Spillback Cap Reductn		•		
Storage Cap Reductn	*			
Reduced v/c Ratio				
Intersection Summary				

Lanes, Volumes, Timings 1: Arlington Street & Mount Auburn Street

Design Year Condition Saturday Midday Peak Hour

Cycle Length: 103

Actuated Cycle Length: 103

Offset: 28 (27%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80 Intersection Signal Delay: 32.0 Intersection Capacity Utilization 73.6%

Intersection LOS: C
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

√ ø1	≠ ø2 (R)	↑ ø3	↓ ø4	#1 ø9
19.s	25 s	10 s	30 s 19 h 19 h 19 h 19 h 19 h 19 h 19 h 19	25.s
∮ ø6 (R)	•	↑ ø8		
38 s		40 s		